



INTERIM REMEDIAL ACTION REPORT

OPERABLE UNIT-3 (OFF-SITE GROUNDWATER)

Prepared for: GLENN SPRINGS HOLDINGS, INC.

Conestoga-Rovers & Associates 651 Colby Drive Waterloo, Ontario N2V 1C2

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LIST OF ACRONYMS

1,1-DCA 1,1-Dichloroethane
1,1-DCE 1,1-Dichloroethylene
1,1,1-TCA 1,1,1-Trichloroethane

1,2-DCE 1,2-Dichloroethylene (total)

ANSI American National Standards Institute

AOC Area of Concern

ARAR Applicable, Relevant, or Appropriate Requirements

BGS Below Ground Surface

BIL Basic Impulse Insulation Level

BRP Beyond Ruco Property
BWD Bethpage Water District
CDM Camp, Dresser & McKee
cis-1,2-DCE cis-1,2-Dichloroethylene
CFM Cubic Feet per Minute

CQAP Construction Quality Assurance Plan

CY Cubic Yards

DAP Diammonium Phosphate

DEC New York State Department of Environmental Conservation

DO Dissolved Oxygen

EPA United States Environmental Protection Agency

FS Feasibility Study gph Gallons per Hour gpm Gallons per Minute

GSHI Glenn Springs Holdings, Inc.

HASP Health and Safety Plan
HDPE High Density Polyethylene
HID High Intensity Discharge
HMI Human Machine Interface

Hooker/Ruco Site Hooker Chemical/Ruco Polymers Superfund Site

HVAC Heating Ventilation Air Conditioning

Hz Hertz

ICM Interim Corrective Measure

IEEE Institute of Electrical and Electronics Engineers

IRAR Interim Remedial Action Report

LIST OF ACRONYMS

IRM Interim Remedial Measure

LFP Low Flow Purging

MCL Maximum Contaminant Levels

mg/L Milligrams per Liter

MS/MSD Matrix Spike/Matrix Spike Duplicate

N Nitrogen

NAPL Non-Aqueous Phase Liquid

NASA National Aeronautics and Space Administration

Navy Naval Weapons Industrial Reserve Plant

Northrop Northrop/Grumman Aerospace Corporation NCDPW Nassau County Department of Public Works

NCDH Nassau County Department of Health NFPA National Fire Protection Association

NTU Nephlometric Turbidity Unit

O,M &M Operation, Maintenance, and Monitoring

ORP Oxidation Reduction Potential

OU-1 Operable Unit - 1
OU-2 Operable Unit - 2
OU-3 Operable Unit - 3

OxyChem Occidental Chemical Corporation

P Phosphorus

PAHs Polyaromatic Hydrocarbons

PC Personal Computer

PCB Polychlorinated Biphenyls

PCE Tetrachloroethylene
PDB Passive Diffusion Bag

PDIR OU-3 Predesign Information Report

PID Photoionization Detector

PID loop Proportional/Integral/Derivative Loop

PLC Programmable Logic Controller

ppm Parts per million

PRAP Proposed Remedial Action Plan

psi pounds per square inch

psig pounds per square inch gauge

LIST OF ACRONYMS

PVC Polyvinyl Chloride

QA/QC Quality Assurance/Quality Control

QAPP Quality Assurance Project Plan

RCRA Resource Conservation and Recovery Act

RI Remedial Investigation

RM Remedial Measure
ROD Record of Decision

scfm Standard Cubic Feet Per Minute

SGC Short-Term Guideline Concentration

SOW Scope of Work

SVOCs Semi-Volatile Organic Compounds

TCE Trichloroethylene

TCL Target Compound List

TICs Tentatively Identified Compounds

TOC Total Organic Carbon

TVOC Total Volatile Organic Compounds

μg/L Micrograms per Liter

ug/m3 Micrograms per cubic meter

USGS U.S. Geologic Survey

UST Underground Storage Tank
VAC Volts Alternating Current
VCM Vinyl Chloride Monomer
VFD Variable Frequency Drive
VOCs Volatile Organic Compounds
WPCP Water Pollution Control Plant

1.0 <u>INTRODUCTION</u>

1.1 PURPOSE OF REPORT

This report has been prepared on behalf of Glenn Springs Holdings, Inc. (GSHI) and presents the Interim Remedial Action Report (IRAR) for the in situ bioremediation of the off-site groundwater (i.e., Operable Unit-3 [OU-3]) at the Hooker Chemical/Ruco Polymers Superfund Site (Hooker/Ruco Site) located in Hicksville, New York. This Remedial Action is designed to address the contaminated groundwater originating from the Hooker/Ruco Site. The contaminated groundwater primarily consists of vinyl chloride monomer (VCM) although other constituents, including PCE and TCE, are present. The VCM has to some extent comingled with chemicals released from other adjacent and upgradient sites and has been labeled as a VCM subplume that exists within the Regional Groundwater Plume. Although chemicals from other sites co-exist with the VCM, the VCM subplume that originates from the Hooker/Ruco Site can be distinctly and separately identified along its track through the Regional Groundwater Plume. The Remedial Action selected for the VCM subplume includes an air injection system to stimulate in-situ biodegradation and a supplemental pump and treat system that is operated by a neighboring industry with whom GSHI is cooperatively working to address the Regional Groundwater Plume.

1.2 SITE DESCRIPTION

The Hooker/Ruco Site is a 14-acre former polymer manufacturing facility. The Site location is shown on Figure 1.1.

Commerce Street and adjacent industrial development comprise the 880-foot northern Site boundary. Along the Site's 1,000-foot eastern side is a large warehouse building formerly-owned by Northrop. A small portion of undeveloped land abuts the Site's 250-foot southern property boundary. Two active tracks of the Long Island Railroad parallel the Site's 940-foot southwestern property boundary. The Hooker/Ruco Site is bounded on the 270-foot western boundary by New South Road. The property is enclosed by a chain-link fence, which completely encompasses the Hooker/Ruco Site. Six surface-water sumps were located on the Hooker/Ruco Site along the eastern and southern property boundary. These sumps historically received process wastewater and storm water runoff. The sumps are now inactive and have been completely or partially filled. Additional details regarding the sumps are provided in Section 1.5.

The area surrounding the Hooker/Ruco Site is comprised of an industrialized corridor and residential complexes. Residential dwellings are located southwest of the Hooker/Ruco Site but the majority of the area is industrial or commercial.

Historically, the major industrial facility in the area was the Northrop manufacturing facility and airport. The Northrop plant is now shut down and Northrop has sold parcels of their property to other parties. There are many other small industries, commercial operations, residential areas, utilities, transportation corridors, and storm-water management basins in the area. Figure 1.1 shows the Hooker/Ruco Site and its surroundings.

1.3 SITE HISTORY

The Hooker/Ruco Site was originally developed by Rubber Corporation of America, a small privately held company. Operations at the Site began in 1945 and included natural rubber latex storage, concentrating, and compounding. Five years later, the plant began producing small volumes of plasticizers. These activities were expanded and modified through the years. In 1956, a polyvinyl chloride (PVC) plant was built, and was initially operated under the name Insular Chemical Corporation. The plant continued in operation until 1975. Hooker Chemical Corporation purchased Rubber Corporation of America in 1965, and operated the facility as the Ruco Division. Hooker has undergone several name changes, with the current name being Occidental Chemical Corporation (OxyChem). The facility was purchased by Ruco Polymer Corporation in February 1982. The facility was thereafter operated by a privately held corporation Ruco Chemical Corporation, which is not affiliated with OxyChem. In 1998, Sybron Chemical Corporation acquired the stock of Ruco Polymer Corporation and in 2000, Bayer Corporation acquired the stock of Sybron Chemical Corporation. Operations at the facility ceased in 2002 and in 2003, Bayer Polymers LLC (n/k/a Bayer Materials Science LLC) assumed the Site. Also in 2003, Bayer demolished the Plant and is currently closing the facility under RCRA, through consultation with the New York State Department of Environmental Conservation (DEC).

1.4 <u>SITE OPERATIONS</u>

Hooker/Ruco Site

Over the life span of the plant, various processes have been employed including the manufacturing of polyesters, polyurethanes, and specialty plasticizers. PVC was

produced at the Hooker/Ruco Site until 1975. In 1956, a partnership was formed with Ross & Roberts of Stratford, Connecticut to construct and operate a PVC production facility at the Site. This venture was known as Insular Chemical Corporation. Insular was later dissolved when Rubber Corporation of America purchased its partner's share. Today, no distinction is made between the property, which was under the control of Insular, and the property, which was owned by Rubber Corporation of America. The Hooker/Ruco Site encompasses all of this property.

Through the years in which Hooker operated the facility, various processes were employed including the manufacture of polyesters, polyurethanes, and specialty plasticizers. Other products included vinyl film, vinyl sheeting, solution polyurethanes, polyurethane latexes, and dry blends, and pelletized plastic compounds. A pilot plant produced polyester, plasticizer, and polyurethane products, and the laboratory was utilized for organic chemical synthesis and technical service.

During the 1950s and 1960s, the Ruco plant utilized three groundwater production wells to provide water to the facility. These three industrial wells correspond to the DEC well numbers 3450, 5368, and 5390. The pumped water was used for various non-contact facility processes. The total pumpage of these wells ranged from 57 gpm to 324 gpm during the 1950s and ranged from 16 gpm to 140 gpm in the 1960s. The wells were abandoned in 1970. The three wells did not exceed a depth of approximately 150 feet below ground surface (BGS). The wells were shallow by comparison to the Northrop production wells which range in depth from 357 to 570 feet BGS. Recharge basin areas were located at the south end of the Hooker/Ruco Site. Storm water runoff was directed to the basins which also received process water discharge.

The operations at the plant have resulted in releases into the groundwater which are being addressed by the remedial construction activities outlined in this report.

Northrop Site

The Northrop Grumman Aerospace Corporation (Northrop) plant was established in the early 1930s and developed a series of naval carrier aircraft and amphibious vehicles. During the 1940s and 1950s, the plant manufactured the Wildcat/Hellcat/Avenger series of aircraft. In the 1960s and 1970s, the plant was involved with several NASA projects including the development of the Orbiting Astronomical Observatory, the ECHO II satellite, the lunar module, and space shuttle components. The plant operations returned to the development of naval aircraft during the 1980s. The plant has been downsized since that time.

The facility included numerous buildings, 14 industrial groundwater production wells (seven on the Navy property which is located immediately adjacent to Northrop's northern property boundary) and five recharge basin areas (one on the Navy property). The pumped water was primarily used for non-contact cooling although some of the water was applied in the plant processes such as parts rinsing and bath operations. The majority of the water was discharged to the recharge basins following use. The wells were operated primarily on facility demand and, as a result, the pumping rates were highly variable throughout the year. The water usage was typically greatest during the summer months.

The operations at the Northrop plant have also resulted in releases into the groundwater which are being addressed by Northrop's remedial systems.

Navy Site

The Naval Weapons Industrial Reserve Plant (Navy) was established in 1933 primarily for the purpose of research prototyping, testing, design and fabrication of military aircraft. The Navy property has been used periodically to store hazardous materials and waste products prior to use or disposal. The site consists of six main buildings, a salvage storage area, Northrop's second largest recharge basin area, and seven Northrop production wells.

The operations at the Navy Site have also resulted in releases into the groundwater which are being addressed in cooperation with Northrop's remedial systems. To some extent, the releases from the Hooker/Ruco, Northrop, and Navy sites overlap with each other and with releases from other properties. However, the releases from the Hooker/Ruco Site can be isolated and identified from the other sources by the presence of VCM which is the signature compound associated with the Hooker/Ruco plant.

1.5 WASTEWATER DISPOSAL PRACTICES

The following descriptions of wastewater disposal practices to the Hooker/Ruco Site sumps are excerpted from the report entitled "Draft Remedial Investigation Report, Hooker/Ruco Site" dated April 1990 (revised August 1992) hereinafter referred to as the 1992 RI Report. Additional details regarding the discharges are presented in the 1992 RI Report.

1.5.1 SUMP 1

From 1951 to 1974, process wastewater from Hooker/Ruco's ester production was fed to the ester plant recharge basin (Sump 1). After 1975, the waste stream was incinerated on site. Sump 1 continued to receive discharge from the floor drains in the pilot plant until 1976. The process wastewater that at one time entered the sump contained one to ten percent mixed glycols and alcohols. It also contained organic acids such as adipic, trimellitic, phthalic and isophthalic and perchloroethylene (PCE) and at times, methanol.

Sump 1 has been partially backfilled and contained a series of six concrete settling basins which have been removed.

1.5.2 **SUMP 2**

Sump 2 received the overflow from Sump 1, as well as stormwater runoff and, therefore, received the same waste products as Sump 1, but in smaller quantities.

1.5.3 **SUMP 3**

Sump 3 received the surface-water runoff from a large part of the plant, including most of the manufacturing areas. There are no direct process waste lines to this sump. Past activities in and around the pilot plant resulted in the release of polychlorinated biphenyls (PCBs) to the soils immediately adjacent to the building (Direct Spill Area). Surface-water runoff and truck traffic dispersed the PCBs to the surficial soils around the Pilot Plant (Transport Related Areas) and to Sump 3. The extent of PCBs in site soils was delineated to a level of 10 parts per million (ppm) by sampling and analysis.

The PCB soils were designated as Operable Unit-2 (OU-2) by the EPA. A FS examining remedial alternatives for OU-2 was prepared and submitted to and approved by the EPA in 1990. The remedial action, which consisted of the excavation and off-Site treatment/disposal of soils with PCB concentrations in excess of 10 ppm, was performed between May 1992 and March 1993 in accordance with the Record of Decision (ROD) and Unilateral Administrative Order issued by the EPA. Additional details regarding the remediation can be found in the Final Remedial Action report for OU-2, which was approved by the EPA in March 1993.

1.5.4 <u>SUMPS 4, 5, AND 6</u>

Sumps 4, 5, and 6 received the waste streams from Plant 2 processes. Sumps 4 and 5 were the primary recipients of the waste streams, with Sump 6 added in 1962 to handle overflow caused by plugging of Sumps 4 and 5. Sump 6, for a relatively short period of time, received only intermittent discharges. The latex and latex compounding processes were in operation from 1945 until 1971. The wastewater contained small quantities of styrene and butadiene. From 1956 until 1975, the facility produced PVC. Wastes from this process were discharged to Sumps 4, 5, and 6. Each year, about two million gallons of process wastewater were discharged to the sumps. Leaving the process, the wastewater stream probably contained 500 to 1,200 ppm of dissolved organics.

An estimate of the breakdown of the organics based on a typical copolymer formulation may be 2 to 3 ppm VCM, 100 to 175 ppm gelatin, 100 to 175 ppm methocel (a soluble form of cellulose), 50 to 100 ppm barium-cadmium stabilizer, a trace of trichloroethylene (TCE) and lauric acid, about 100 ppm of sodium acetate/bicarbonate and 250 to 650 ppm of vinyl acetate.

Sumps 4, 5, and 6 have since been completely backfilled. Additional details regarding the sumps are presented in the 1992 RI Report. The locations of the former and existing sumps are shown on Figure 2.1.

1.5.5 <u>UNDERGROUND STORAGE TANKS</u>

All underground storage tanks were removed prior to 1988 by Ruco Polymers. No records were kept of their condition upon removal. No leak testing was performed, and, with the exception of soil removed from around the fuel oil tanks, there is no record of soil removed from around the tanks. Additional details regarding the USTs are presented in the 1992 RI Report.

1.6 REGULATORY AND ENFORCEMENT HISTORY

Several environmental investigations have been conducted at the Hooker/Ruco Site since 1978. Originally, efforts were directed toward understanding past manufacturing processes, waste generation, and waste disposal. A site background report was prepared in July 1981. This report presented the Hooker/Ruco Site in the context of its surroundings and examined waste disposal, regional geology and hydrogeology, regional groundwater withdrawals, and groundwater quality.

At that time, the DEC was the lead government agency. A work plan for conducting a soils and groundwater investigation was submitted to the DEC in April 1983. By June 21, 1983, the plan had been approved and the investigation commenced. The investigation consisted of the drilling and installation of six well clusters at locations downgradient of suspected areas of waste disposal, and the drilling and sampling of two deep test borings in formerly operating sumps. The results of this study were presented in a report entitled "Report of Groundwater & Soils Investigation at the Former Ruco Division Plant Site, Hicksville, New York", dated August 1984.

In July 1987, EPA sent OxyChem a request for information on the Hooker/Ruco Site. A response to the EPA request for information was submitted in September 1988. OxyChem entered into an Administrative Order on Consent with EPA in September 1988. Subsequently, a Field Operations Plan, based on an EPA Work Plan, was submitted for EPA review in October 1988.

Between September 1989 and March 1990, a RI was conducted at the Hooker/Ruco Site. The investigation included a soil-vapor study, electromagnetic terrain conductivity survey, recharge basin (sump) water and sediment sampling, shallow and deep soil sampling and groundwater sampling. A total of 134 soil samples were collected from 50 borings for analysis of target compound list (TCL) parameters and tentatively identified compounds (TICs). Eight deep wells and 14 shallow wells were installed on and off site to complement the existing 12 on-site wells. Two off-site piezometers were installed to help define the groundwater flow pattern. Thirty-nine new and existing wells were sampled and analyzed for TCL/TIC parameters. A Remedial Investigation (RI) and Feasibility Study (FS) were completed for the Hooker/Ruco Site in August 1992 and August 1993, respectively.

The risks for exposure to groundwater at the Hooker/Ruco Site boundary were calculated in the report entitled "Revised Final Risk Assessment and Fate and Transport Report, Operable Unit 1" dated October 1992.

The calculated risks showed that for current residents, the carcinogenic and non-carcinogenic risks were below levels of concern and that for future construction workers (e.g., for remedial action) and trespass children, the risks were within or below the levels of concern (i.e., 10^{-4} to 10^{-6} for carcinogenic risk and Hazard Index <1 for non-carcinogenic risk).

The calculated risks for future residents showed that the majority of the carcinogenic risk (65 to 99 percent) was attributed to potential exposure to VCM. It is reasonable to

assume that if the risk attributable to VCM is controlled, the risks contributed by the other chemicals of concern (e.g., PCE) would also be controlled. Thus the remedial efforts associated with the Hooker/Ruco Site have been focused on the elimination of VCM. It has been accepted that by remediating the VCM, which is the primary compound of concern and the most prevalent, any other compounds released from the Hooker/Ruco Site will be simultaneously addressed. For example, trace levels of PCE and TCE that may have been released from the Hooker/Ruco Site will either be treated by the anaerobic conditions that are created by the VCM; natural attenuation along the flow path within the groundwater; or be captured by the Northrop pump and treat system.

In April 1994, OxyChem initiated a program to investigate groundwater conditions beyond the Ruco property (BRP). The activities were described in the plan entitled "Work Plan for Groundwater Investigations Beyond the Ruco Property, August 1994" (BRP Work Plan) and in a subsequent Addendum dated September 1995. The results were provided in the report entitled "Remedial Investigation Report, Operable Unit-3" dated July 2000.

The adjacent aerospace manufacturing facility operated by Northrop has also impacted the Bethpage regional aquifer and has conducted an RI/FS pursuant to a Consent Agreement with the DEC. Adjacent to the Northrop site is the Navy site, which is also the subject of an RI/FS under the Comprehensive Long-Term Environmental Active Navy Program. The RI's for the Northrop and Navy sites were completed in September 1994 and October 1993, respectively. Based on the findings of these RI's, Northrop has implemented an Interim Remedial Measure (IRM) which includes treatment at the Bethpage Water District (BWD) wells south (downgradient) of the Northrop site and the pumping and treatment of groundwater from Northrop on-site production wells GP-1, GP-3, ONCT-1D, ONCT-2D, and ONCT-3D.

Groundwater sampling conducted as part of the RIs for the Hooker/Ruco, Northrop and Navy sites shows that the primary chemicals in the groundwater based on concentration and frequency of detection for the Northrop and Navy Sites are chlorinated VOCs, mainly TCE, PCE, and to a lesser degree 1,1,1-trichloroethane (1,1,1-TCA), 1,2-dichloroethylene (1,2-DCE), 1,1-dichloroethylene (1,1-DCE), and 1,1-dichloroethane (1,1-DCA). The primary groundwater chemical for the Hooker/Ruco Site is VCM. TCE, PCE, 1,1,1-TCA, 1,2-DCE, 1,1-DCE, and 1,1-DCA are also present in the groundwater. Secondary groundwater chemicals detected at the sites are as follows:

i) Navy: Semi-Volatile Organic Compounds (SVOCs) including bis(2-ethylhexyl)phthalate, di-n-butylphthalate, di-n-octylphthalate,

2-methylphenol, 4-methylphenol; 2,4-dimethylphenol, naphthalene, acenaphthylene, fluoranthene, benzo(b)fluoranthene, and pyrene; inorganics including cadmium, chromium, and thallium, and TICs including polyaromatic hydrocarbons (PAHs), substituted benzenes, alkanes, substituted phenols, and carboxylic acids

- ii) Northrop: inorganics including arsenic, cadmium, and chromium
- iii) Hooker/Ruco: TICs including glycols, diols, and acids

Because the impacts on the Bethpage regional aquifer by the three adjacent facilities have intermingled to some degree, it was agreed by all parties in the spring of 1995 that a regional evaluation and remedy be developed to address the combined TVOC conditions created. However, in order to expedite the program, a decision was made in November 1998 to separate the RI/FS process into two parts. The DEC is working with Northrop and the Navy to address the overall TVOC plume while the EPA is working with GSHI to address the VCM subplume. While these plumes do overlap to some extent, the VCM subplume emanating from the Hooker/Ruco Site remains separate and identifiable through the geologic layers within the aquifer.

The DEC, Northrop, and Navy prepared a Groundwater FS (dated November 2000) which addressed the regional TVOC groundwater plume. A Proposed Remedial Action Plan (PRAP) was issued by the DEC in November 2000 and the ROD for the regional TVOC groundwater plume (designated as Operable Unit-2 for the Northrop/Navy sites by the DEC) was issued on April 24, 2001. The Remedial Measure (RM) described in the Northrop/Navy OU-2 ROD included continued operation of the IRM groundwater extraction and treatment system and the wellhead treatment of impacted public water supply wells. Northrop and the Navy are continuing to investigate the areal and vertical extent of the TVOC plume further to the south of the RM using vertical profile borings. The data from these borings have been provided to GSHI to assist in the understanding of the regional conditions.

Computer simulations presented in the OU-3 RI Report for the Hooker/Ruco Site show that the Northrop RM would fully capture the VCM subplume if the VCM was allowed to continue to migrate with the natural groundwater flow. Thus, any remedial actions that are implemented by GSHI to address the VCM subplume as a separate component of the TVOC plume is an enhancement to an already effective remedy.

Data from the various studies that have been performed provided the additional data on the regional groundwater conditions that were necessary to evaluate effective remedial action alternatives for the VCM subplume. The evaluation of remedial action alternatives was presented in the document entitled "Feasibility Study for Operable Unit-3" (OU-3 FS Report), dated July 2000.

The objective of the OU-3 FS Report was to develop, evaluate, and select potential remedial alternatives that can be implemented to protect human health and the environment from risks associated with the groundwater containing elevated VCM as well as any other chemicals in the VCM subplume that are attributable to the Hooker/Ruco Site. For the purposes of the FS, reference to the VCM subplume is intended to include all of the chemicals within the VCM subplume that are attributed to the Hooker/Ruco Site. It is recognized that VCM is the primary compound although other compounds are included in the subplume.

Based on the evaluation presented in the OU-3 FS Report, the EPA issued a PRAP for the VCM subplume on July 25, 2000. The PRAP's preferred remedial action incorporates the use of biosparging within the VCM subplume with the contingency of a pump and treat system if biosparging is shown not to be able to achieve the remedial action objectives in a reasonable time frame. The Record of Decision for OU-3 was finalized by the EPA on September 29, 2000. The selected remedial action incorporates the use of in situ bioremediation treatment of the VCM subplume using biosparging (with supplemental nutrient addition, if necessary). Furthermore, the OU-3 ROD retained the contingency pump and treat remedy (if needed) as described in the OU-3 PRAP. The Administrative Order for the Remedial Design and Remedial Action (RD/RA) for the VCM subplume (i.e., Index No. II-CERCLA-02-2001-2018) was received by GSHI on May 4, 2001.

To obtain the information needed to assist in the design of the OU-3 biosparge remedy, GSHI undertook a number of predesign activities. The scope for the predesign work was primarily outlined in the document entitled "OU-3 Predesign Activity Scope of Work" (OU-3 Predesign SOW), originally submitted in June 1999. A revised Scope of Work was submitted on January 23, 2002 and approved by the EPA on February 8, 2002. The results of the work were provided in the report entitled "Off-site Groundwater Predesign Information Report" (PDIR) dated November 22, 2002. The PDIR was approved by the EPA on July 29, 2003.

1.7 GEOLOGY/HYDROGEOLOGY

1.7.1 <u>GEOLOGY/HYDROGEOLOGY</u>

In summary, the regional stratigraphy generally consists of unconsolidated overburden deposits of clay, silt, sand, and gravel overlying a shist and gneiss bedrock. The overburden units, in order of increasing depth, are:

- i) Upper Glacial aquifer (medium to coarse sand, 75± feet thick)
- ii) Magothy aquifer (fine to medium sand with interbedded discontinuous layers of coarse sand and silty clay, maximum thickness 650± feet)
- iii) Raritan Confining Unit (silty clay, 175± feet thick)
- iv) Lloyd aquifer (fine to coarse sand, 300± feet thick)

In the vicinity of the Hooker/Ruco Site, the overburden stratigraphy consists of the same four units. The Upper Glacial Aquifer ranges in thickness from 30 to 70 feet. The Magothy Aquifer underlies the Upper Glacial Aquifer. The Magothy Aquifer is underlain by the Raritan Confining Unit, the top of which is the vertical extent of the hydrogeologic regime evaluated during the OU-3 RI and 2002 investigations. In general, the stratigraphic logs indicate the presence of coarse sand and gravel material to depths of approximately 70 feet to 100 feet BGS in the vicinity of the Hooker/Ruco Site. This material is representative of the coarse deposits of the Upper Glacial aquifer. Below this depth, interbedded layers of fine sands, silts, sandy clays, and clays become dominant although some layers of coarse material are evident. The finer deposits interbedded with clay layers or lenses are characteristic of the deposits that comprise the Magothy aquifer.

Below the Upper Glacial deposits, continuous fine-grained (e.g., clay) layers cannot be identified between more than two adjacent monitoring wells. In some cases, it is difficult to correlate the fine-grained layers between immediately adjacent wells. The intermittent nature of the fine-grained layers is expected to strongly influence groundwater flow paths in both the horizontal and vertical directions. The groundwater flow paths are expected to vary significantly around the discontinuous fine-grained lenses as the more permeable pathways are sought.

1.7.2 GROUNDWATER LEVELS

The water table generally is located near the base of the Upper Glacial aquifer and the Upper Glacial aquifer is largely unsaturated in the vicinity of the Hooker/Ruco Site. Groundwater in the Upper Glacial Aquifer and Magothy Aquifer generally flows from north to south with local variations due to the effect of pumping wells and recharge basins.

Pumping of the Northrop production wells would have reinforced (increased) the natural north to south hydraulic gradient from the Hooker/Ruco Site and the northern portions of the Northrop and Navy sites, thereby drawing chemicals from these areas to the Northrop production wells keeping the chemicals on the Northrop and Navy sites. Therefore, the chemicals in groundwater at the Hooker/Ruco Site and northern portions of the Northrop and Navy sites would have principally migrated from north to south, thereby preventing extensive lateral migration to the west and the east from the area of the three sites.

1.7.3 GROUNDWATER CHEMICALS RESULTS

The groundwater analytical results assessment presented in the following section focuses on the known extent of PCE, TCE, and VCM in the area south of the Hooker/Ruco Site. These three compounds are those most frequently detected although the VCM subplume is the primary topic of this report. The data presented include the information from the wells installed in 2002 and further refines the understanding of the horizontal and vertical extent of the VCM subplume.

1.7.3.1 RI GROUNDWATER RESULTS

The OU-3 RI results indicated that the Hooker/Ruco Site is not the source of chemicals to the Hicksville municipal wells located to the west and northwest of the Hooker/Ruco Site.

As presented in the OU-3 RI Report, the pattern of VCM analytical results with time for GP-6, GP-8, and GP-14 showed that when these three wells were pumping, they reinforced the natural north to south groundwater gradient and drew VCM toward them from areas to the north and northwest of these wells. These pumping wells also helped draw the VCM to deeper portions of the aquifer. This pumping scenario resulted in the creation of two prongs of VCM migration, one to the area of GP-6 and the other to

the area of wells GP-8 and GP-14. This occurred until 1992 when these wells were turned off. It is believed that chemicals potentially attributable to the Hooker/Ruco Site migrated to and were captured by these wells prior to 1992 and that the most southerly extent of the VCM subplume prior to 1992 was GP-6.

When pumping stopped at GP-6, GP-8, and GP-14 in 1992, the groundwater flow system returned to a more natural condition in the areas of these wells. However, the natural north to south gradient was still being maintained by the pumping of GP-1 and GP-3 which are located further downgradient. With the pumps at GP-6, GP-8 and GP-14 no longer drawing the VCM toward them, the chemicals in the VCM subplume have migrated with the natural southerly groundwater flow and are converging on the flow paths associated with the pumping of Northrop wells GP-1 and GP-3.

This is supported by the absence of VCM in the well nests of MW-56 and MW-57 and by the particle track simulations presented in the RI Report. The particle track simulations showed that particles released from all intervals for the entire Hooker/Ruco Site will be captured by the Northrop RM. The particle track simulations also showed that chemically impacted groundwater underlying the Hooker/Ruco Site does not flow to the Hicksville wells.

1.7.3.2 PRE-DESIGN INVESTIGATION RESULTS

The results of the Pre-Design Investigation indicated that the groundwater in the regional TVOC plume is generally aerobic and natural attenuation of VCM in the groundwater is occurring. However, in the VCM subplume, the available oxygen has been depleted and needs to be replenished in order for VCM degradation to continue. In addition, continued degradation in the VCM subplume may become limited by the lack of carbon sources and potentially by a lack of phosphorus. Natural attenuation of VCM by biodegradation has occurred in the vicinity of monitoring wells MW-50J1, MW-50J2, MW-52S, and MW-52I. PCE and TCE biodegradation is limited, but has occurred historically as demonstrated by the presence of cis-1,2-DCE in the PCE/TCE plume wells, VCM subplume boundary wells, and downgradient wells. This slow degradation is likely due to the presence of aerobic conditions which inhibits PCE degradation and retards TCE degradation. Natural attenuation of VCM by the oxidation pathway will be enhanced by the addition of dissolved oxygen (DO) and, if needed, carbon sources in the VCM subplume.

In summary, the data from the Pre-Design Investigation led to the following key observations:

- i) The distribution of redox parameters indicates that, in general, groundwater in the regional area is aerobic and biodegradation of VCM is occurring.
- ii) The redox parameters in the center of the VCM subplume indicate that the groundwater in this area is in a reducing state (anaerobic).
- iii) Natural attenuation of VCM by the aerobic biodegradation pathway will be enhanced by the addition of DO and, if needed, carbon sources in the VCM subplume.
- iv) VCM anaerobic degradation products (ethane and ethene) were observed at monitoring wells MW-50J1, MW-50J2, MW-52S, and MW-52I, indicating that anaerobic biodegradation of VCM by reductive dehalogenation has occurred in the VCM subplume.
- v) The PCE and TCE degradation product cis-1,2-DCE was observed in PCE/TCE plume wells and downgradient monitoring wells in association with the parent compounds, indicating that degradation of PCE and TCE is slowly occurring in the area due to the predominantly aerobic conditions.
- vi) The DCE may be degrading directly to CO₂, chloride, and water because of the aerobic conditions. This is likely why VCM is not being detected outside the limits of the VCM subplume.

The results of the natural attenuation evaluations indicated that destructive natural attenuation processes have contributed to the reductions in PCE, TCE, and VCM concentrations over time. They have resulted in the biotransformation of some PCE, TCE, and VCM to relatively innocuous compounds (i.e., ethene, ethane, methane, chloride, carbon dioxide and water). However, continued PCE and TCE degradation will be slow to occur due to the predominantly aerobic conditions in the TVOC plume. Similarly, continued VCM degradation in the VCM subplume will be slow to occur due to the predominantly anaerobic conditions therein. VCM degradation can be significantly enhanced by the addition of oxygen and may be further enhanced by the addition of carbon sources and nutrients into the VCM subplume.

The principal results obtained from the injection testing were:

- i) The formation has the capacity to easily accept the planned air flow rates.
- ii) The addition of both liquid and gas amendments were practical.
- iii) Air plugging of the formation is unlikely to occur.

- iv) DO can permeate into silty intervals that do not accept injected air directly.
- v) Water injection can be used to redevelop wells that decrease in air capacity.
- vi) No detectable vapors should reach the ground surface.
- vii) The injection tests were not run long enough to establish an area of influence for an individual well. Such establishment was not an objective of the testing performed. The design strategy was to install and operate a Pilot System over a longer term to determine an effective well spacing for a full scale remedial system.

While the impacts to soils at the Site have been addressed through remedial activities, some impacts due to the historic chemical releases persist in the groundwater. The groundwater impact has migrated off Site and is now commingled within the regional plume. The studies that have been performed over the years have defined the horizontal and vertical extent of the chemical plume emanating from the Hooker/Ruco Site which is primarily characterized as a VCM plume. The ROD that was issued for the Site in 2000 determined that the appropriate remedy for the off-site groundwater plume of VCM (i.e., OU-3) would incorporate the use of in situ biosparging. The ROD also included a contingency remedy involving pump and treat technologies if the biosparging was not able to achieve the remedial action objectives in a reasonable time frame.

Considering that the VCM has migrated to recovery well GP-3 on Northrop property, the remedy has evolved into a dual remediation program involving both biosparge and pump/treat technologies for the northern and southern portions of the VCM plume, respectively. GSHI has worked cooperatively with Northrop to address the leading (southernmost) portion of the VCM plume using Northrop's existing GP-1/GP-3 pump and treat facility. Northrop's facility is being operated to address Northrop's groundwater plume of VOCs. With some modification of the Northrop treatment facility, the facility capably addresses the commingled Hooker/Ruco Site VCM plume and the Northrop VOC plume.

While the pump and treat technology will capture and remove the leading portion of the VCM subplume, the primary remedial technology for the VCM subplume remains in situ bioremediation promoted by the installation of two fence lines (middle and north) of air injection wells in the north/central portion of the VCM subplume. The injection of air into the middle of the VCM subplume will increase the rate of natural degradation of the VCM into inert compounds as the subplume continues to migrate south toward the Northrop GP-1/GP-3 pumping system. The air injection in the two fence lines promotes sufficient degradation to eliminate the need for any additional

injection wells in the southern portion of the subplume. In conjunction with the continued operation of Northrop's pump and treat system, the biosparge system eliminates the need for any additional groundwater treatment of VCM downgradient of the Northrop system.

The estimated areal limit of the VCM subplume prior to 2005 is shown on Figure 1.2 and a cross-section of the VCM subplume prior to 2005 from the Site through to the vicinity of GP-1/GP-3 is shown on Figure 1.3. The estimated areal limit of the VCM subplume in 2011 is shown on Figure 1.4. The VCM concentrations on Figure 1.4 show the effectiveness of the Biosparge Pilot System in reducing VCM concentrations and also the effect that natural attenuation has had on the size and concentrations of the VCM subplume.

The 100% Final Design Report submitted May 27, 2005 and approved July 7, 2005 presents the planned remedial components associated with the two fence lines of biosparge injection wells.

1.8 PRIOR REMEDIAL ACTIVITIES

Prior remedial activities have been performed for Operable Unit 1 (OU-1) and Operable Unit 2 (OU-2) at the Site.

1.8.1 OPERABLE UNIT 1

A summary of the remedial actives performed by GSHI for OU-1 are listed below:

Date	Activities
November 2000	 Concrete tank removed from Sump 1
December 2001	 Excavated and off-site disposal of 327 tons of PCB – impacted soil
	 Installation of a soil flushing system in Sump 1 to enhance the cleanup of the remaining minimal chemical presence in the unsaturated soils (PCE and di-n-butyl phthalate)

August 2002, March 2003 March 2004, March 2005 Flushing of Sump 1 using approximately 16,000 US gallons of potable water for each event which reduced the

chemical concentrations in the soil but did not result in a measureable increase in chemical concentrations in the underlying groundwater

March 16, 2006 Final OU-1 Sampling and Evaluation document submitted

to the EPA

September 28, 2007 Remedial Action Report for Operable Unit One approved

by the EPA

1.8.2 OPERABLE UNIT 2

A summary of the remedial activities performed by GSHI are listed below.

Date	Activities
May to September 1992	 Approximately 52 cubic yards (CY) of soil with PCB concentrations exceeding 500 ppm were shipped off-site and thermally destroyed at a TSCA-permitted incineration facility
	 Approximately 2,152 CY of soil with PCB concentrations between 10 and 500 ppm were shipped off-site and disposed at a TSCA permitted landfill
March 12, 1993	EPA approval received of Remedial Action Report for Operable Unit 2

In addition, GSHI has assisted Bayer in their closure of the Site. Remedial activities conducted at the Site by Bayer pursuant to their RCRA Corrective Action Program consist of the following:

- Removal of approximately 30 CY of PCB-impacted soil from the former electrical transformer area (AOC 39), removal of a former gasoline underground storage tank (UST) (AOC 50), and cleaning of subsurface structures as part of an initial Interim Corrective Measure in 2005
- Removal of a Underground Storage Tank encountered beneath Plant 2 (AOC 51) and an unrelated, small isolated amount of pooled non-aqueous phase liquid (NAPL) encountered beneath Plant 2 during foundation demolition activities in 2006
- Removal of approximately 670 CY of PCB-impacted soil (greater than 50 ppm) from AOC 45 as part of an ICM during 2006

• Removal of approximately 8,774 CY of PCB-impacted soil from "the eastern plant area" as part of an ICM in 2009

1.9 ORGANIZATION OF REPORT

This IRAR is organized as follows:

- <u>Section 1.0 Introduction</u>: Discusses the purpose of the report and outlines the components of the OU-3 remedial action
- <u>Section 2.0 Background</u>: Summarize requirements specified in the ROD.
- <u>Section 3.0 Construction Activities</u>: Provides a step by step summary of the activities undertaken for construction and implementation of the biosparge system
- <u>Section 4.0 Chronology of Events</u>: Provides a tabular summary of the major events of the remedy starting with the signing of the ROD
- Section 5.0 Performance Standards and Construction Quality Control: Describes the overall performance of the technology in achieving cleanup goals, compliance with construction quality assurance/quality control requirements and analytical data QA/QC
- <u>Section 6.0 Inspections and Certification</u>: Describe the results of Pre-Final and Final Inspections and a certification by responsible corporate official that the information contained in this report is true, accurate and complete
- <u>Section 7.0 Operation and Maintenance Activities</u>: Describes the operation and maintenance of the system and the monitoring program that assesses the effectiveness of the remediation
- <u>Section 8.0 Observations and Lessons Learned</u>: Describes lessons learned from operation of the Pilot System and the Biosparge System design modifications implemented
- <u>Section 9.0 Contact Information:</u> Provides the contact information for GSHI, CRA, EPA, DEC and property owner representatives

1.10 INTERIM REMEDIAL ACTION REPORT COMPONENTS

The components of this IRAR include:

i) As-recorded Drawings

- ii) Stratigraphy, Geophysical, and Well Instrumentation Logs
- iii) Certificates

2.0 BACKGROUND

2.1 SUMMARY OF THE RATIONALE FOR THE SELECTED REMEDY

The biosparge remedy was selected because it is a cost-effective and reliable measure to significantly decrease the VCM concentrations within the center of the subplume in a relatively short time frame. The remedy permanently mitigates the threat posed by VCM, and results in minimal disruption of commercial activities on or around the properties where the system is installed. The biosparge remedy along with natural attenuation removes and reduces the concentration of VCM to a level that achieves State drinking water standards or Federal MCLs.

A benefit of the biosparge remedy is that groundwater is not extracted from or discharged to the aquifer. Additionally, the construction of a treatment system, recharge basins, and force mains are not required. Therefore, the biosparge remedy results in minimal stress to the environment.

The remedy relies on the continued operation of the Northrop Treatment System to address the commingled VOC groundwater plume. This system will also prevent the subplume's further migration.

The biosparge remedy will be protective of human health and the environment, will comply with ARARs, will be cost-effective, and will utilize permanent solutions and treatment technologies to the maximum extent practicable.

2.2 <u>OBJECTIVES/GOALS</u>

In accordance with the ROD, the major components of the remedy include:

- The use of biosparging technology in an in-situ application to enhance the VCM degradation with the goal of achieving State drinking water standards or Federal maximum contaminant levels (MCLs). Biosparging is a form of bioremediation that involves the introduction of air/oxygen into the aquifer to increase the DO content in the aquifer, which will enhance aerobic degradation of the VCM subplume. The biosparging will work in concert with natural attenuation to achieve the State drinking water standards or Federal MCLs.
- Vertical injection wells will be installed in the area of the VCM subplume to a depth of 200 to 400 ft. Additives (air/oxygen, nutrients) will be forced into the formation using either static head within the well or using pump-supplied pressure.

- A vadose zone or unsaturated zone monitoring program will be implemented to ensure that air stripping of VOCs, particularly VCM, is not occurring as a result of biosparging.
- If necessary, the selected remedy will also utilize a supplemental aerobic bioremediation technology following the biosparging treatment. Supplemental bioremediation would involve the injection of nutrients (potentially including nitrogen and phosphorus along with suitable carbon sources such as sugar byproducts) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer.
- A long-term monitoring program will be developed to monitor groundwater quality
 in the area of the VCM subplume and to evaluate the fate and migration of VOCs
 southward and westward beyond the VCM subplume. The objective of the
 long-term monitoring program is to evaluate the effectiveness of the selected
 remedy.

The selected remedy is also based on the recognition that an existing groundwater extraction and treatment system (Northrop Treatment System) which is operating as an IRM at the downgradient Northrop Site is containing and remediating a commingled plume of TCE and PCE contamination from the Northrop, Navy and the Hooker/Ruco sites. EPA's selected remedy for the Hooker/Ruco Site, designated as Operable Unit Three (OU-3), together with the Northrop Treatment System, will prevent further migration of groundwater contamination and will effectively address the contamination emanating from the Hooker/Ruco Facility.

The objectives of the remediation for OU-3 at the Hooker/Ruco Site are:

- 1. To reduce contaminant levels in the groundwater in a timely manner after startup of the entire system to achieve State drinking water standards or Federal MCLs. It is estimated approximately 12 years will be required to achieve this objective.
- 2. To prevent the need for supplemental treatment at the Northrop Treatment System.
- 3. To protect human health and the environment from risks associated with the contaminated groundwater.

In other words, Remedial Action Objectives for groundwater are to protect human health from exposure (via ingestion, inhalation, and dermal contact) to VCM, TCE, PCE, and TICs in groundwater affected by the Hooker/Ruco Site at concentrations in excess

of New York State drinking water standards and Federal MCLs and also to restore the portion of the aquifer affected by the Hooker/Ruco Site to meet New York State Groundwater Standards and New York State and Federal MCLs in a timely manner.

Since issuance of the ROD, VCM has migrated to the Northrop well GP-3. Thus Objective 2 is no longer achievable. Modifications to the Northrop Treatment System have been implemented by GSHI (in cooperation with Northrop)_to address the VCM pumped by GP-3.

Achievement of Objectives 1 and 3 will be accomplished using in situ bioremediation treatment of the VCM subplume using biosparging (with supplemental nutrient addition, if necessary) and natural attenuation. The ROD contained a contingency of relying solely on a pump and treat system (as is being used for the southernmost portion of the VCM subplume) if biosparging is shown not to be able to achieve the remedial action objectives in a reasonable time frame for the VCM subplume. Based on the data collected from the Pilot System, biosparging has significantly reduced VCM concentrations in a reasonable time frame. Thus, it is unlikely that the contingency will be implemented.

The primary goal as stated in the 100% Final Design Report is to create an aerobic environment to biodegrade the VCM in situ. The remedial action focuses on developing an injection system that is capable of delivering the necessary components (oxygen and, if necessary, carbon sources) to create conditions conducive to the aerobic degradation of VCM within the VCM subplume. The remedy primarily concentrates on the central core areas of the VCM subplume where elevated concentrations (typically greater than 40 ug/L) have been found to exist. Once the concentrated VCM areas have been remediated, the peripheral low concentrations are expected to be susceptible to the naturally occurring degradation conditions that exist, or will be created, in the groundwater resulting in a collapsing reduction of the VCM subplume.

The aquifer has considerable natural degradation capability as evidenced by the fact that the perimeter edges (both sides plus the top and the bottom) of the VCM subplume are being reduced by biodegradation processes. The perimeter areas have oxygen, nutrients, carbon sources, and microbes available that biodegrade these low level VCM concentrations. It is only in the core area of high VCM concentrations where the oxygen has been consumed, thus limiting the VCM biodegradation process. It is noted that the low level PCE and TCE concentrations within the VCM subplume are effectively biodegraded due to the anaerobic conditions created by the VCM. Thus PCE and TCE were also naturally treated in-situ during this process. The injection of oxygen into the central core of the VCM subplume, replenishes the oxygen supply to restart and enhance

the VCM biodegradation process after the PCE and TCE have been degraded. PCE and TCE associated with the Hooker/Ruco Site that is not degraded will be captured by the Northrop treatment system.

It was also recognized that the large plume of PCE and TCE from sources other than the Hooker/Ruco Site would also be naturally degrading to VCM. Since the Hooker/Ruco VCM subplume and the regional plumes co-exist in some areas, it would be unreasonable to expect that all of the VCM detected in the monitoring wells was sourced from the Hooker/Ruco Site. Low level VCM presence should be expected throughout the regional PCE/TCE plume. Therefore, the concentration of 40 micrograms per liter (µg/L) was selected as a reasonable concentration for the biosparge system's injection wells to achieve fully expecting that natural attenuation will address any minor residual VCM concentrations, and failing that, it would be captured and treated by the Northrop GP-1/GP-3 treatment system. Further, once the high concentration portion of the VCM subplume has been addressed, it is unlikely that so much oxygen would be consumed in aerobically treating the remaining VCM that it would deplete the oxygen concentration to the point that the aquifer would again become anaerobic. Therefore, there will be sufficient oxygen available to completely biodegrade the remaining VCM as the groundwater continues its southerly migration.

The parameters to evaluate the performance of the biosparge system are:

- Dissolved Oxygen (DO): desired groundwater concentration of >2 milligrams per liter
- Total Organic Carbon (TOC): desired groundwater concentration of 5 ≤ TOC ≤10 milligrams per liter (mg/L)
- VCM: decreasing concentrations

Of the above three parameters, the VCM concentration is the critical parameter. If the VCM concentrations are decreasing and are consistent with meeting the remedial objectives, the need to achieve the desired concentrations for DO and TOC is not imperative.

2.3 DESIGN BASIS

This remedy consists of the injection of air at a rate sufficient to convert the generally anaerobic conditions in the groundwater downgradient of the injection wells located within the central core of the VCM subplume to aerobic conditions and then supply

sufficient oxygen to continue to maintain aerobic conditions as biodegradation of the chemical compounds, principally VCM, occurs. This remedy also takes into consideration the requirement that the air flow rate selected will not result in the release of VOCs to the atmosphere. If monitoring shows that biodegradation is being inhibited by insufficient TOC or nutrients, low level concentrations (approximately 5 to 10 mg/L) of a carbon source (i.e., sugar byproducts) and/or nutrient (e.g., diammonium phosphate [DAP] or a similar material) will be injected. The particle tracking results provided in the May 27, 2004 submission to the EPA showed that the entire VCM subplume will be captured by either the combined pumping of GP-1/GP-3 at pumping rates of 1,075 and 375 gallons per minute (gpm), respectively, or the pumping of GP-1 only at a pumping rate of 1,075 gpm. Thus, any amendments injected into the aquifer and not consumed, will be captured and will not impact areas outside the containment area of GP-1/GP-3.

It is noted that as the groundwater flows towards GP-3, it is anticipated that the groundwater flow paths will merge together, thereby creating better contact of the injected materials with the VCM impacted groundwater, if any, that flows between the effective radius of the individual injection wells. In addition, the injected materials will at least initially disperse both horizontally and vertically as they are injected and to some degree as southerly migration continues. This natural distribution of injected materials with the converging VCM impacted groundwater will make the remedy more effective as the groundwater continues to flow south. The monitoring described in Section 7.0 will determine achievement of the remedial goals.

It is recognized that VCM degradation will continue to occur as long as there is sufficient oxygen, carbon source, and nutrients available in the groundwater. Therefore, it is expected that VCM degradation to non-detect concentrations is possible as long as the conditions conducive to degradation are maintained.

The first step of the remediation strategy was to install a Pilot System and operate the Pilot System over a longer term to determine an effective well spacing for a full scale remedial system. The Pilot System included the control center, force main to four injection wells in the central portion of the middle fence line, four injection well nests (IW-16 through IW-19), and the monitoring wells for these injection wells (see Drawing MP-01).

The operation of the Pilot System provided the information necessary to finalize the injection well spacing and injection rates, confirmed that supplement injections are not needed, and established the other operating parameters to ensure that the rest of the full system has been properly designed and installed. This information has been compiled

since the time that the Pilot System first began operation in October 2006. The design of the final system incorporates all of the details obtained from the Pilot System and have been included in the construction of the final system which was completed in August 2012. The final system began full-time operation on September 17, 2012.

3.0 BIOSPARGE TREATMENT SYSTEM INSTALLATION

3.1 GENERAL

The biosparge system was installed/constructed in accordance with the 100% Final Design Report except for the modifications described in the following sections of this report. All substantive modifications were approved by the EPA prior to their implementation.

Following EPA approval of the 100% Final Design Report, the groundwater remediation for the Site was implemented. Project implementation included the following tasks:

- i) Property access/easements were secured from property owners
- ii) The required construction/operating permits were obtained
- iii) The remedial system was constructed
- iv) The remedial system was started up and operated

Prior to initiating the construction of the groundwater remediation, easements and access agreements were negotiated with the affected property owners. The site layout drawing (Figure 1.2) shows the area occupied by the remediation system. As shown, there are several properties that were affected.

The biosparge system was installed in two phases. The first phase was the Pilot System which included the control building and the first four injection well nests. The control building and other components of the Pilot System (e.g., air compressor, air and water piping, controls, power and control conduits, and wiring, etc.) were installed and tested from November 2005 through September 2006.

The control center facility includes process equipment designed to inject air, water, and a carbon source (if needed), into the main VCM subplume in order to enhance VCM degradation. The control building is located on a parcel of property that is located west of South Oyster Bay Road and south of Hazel Street. The Northrop pumping well GP-6 was historically located on this parcel. This location was selected due to its proximity to the middle injection well fence line and its availability. The Pilot System became fully operational in October 2006.

The remainder of the biosparge system was installed in three stages:

- 1. The north fence underground components, excluding the injection and monitoring wells, were installed from September through December 2008
- 2. The injection and monitoring wells for the north fence and the remainder for the middle fence were installed from September 2010 through May 2011
- 3. The remaining biosparge system components (e.g., remainder of middle fence injection well vaults, power and control conduits and wiring, controls, air and liquid piping, etc.) were installed from March through August 2012

A chronology of the construction, operation, and monitoring of the Pilot System and construction of the remainder of the biosparge system is provided in Table 3.1.

Design drawings for the biosparge system and the control building are attached separately. The list of design drawings is provided in Appendix A.

3.2 <u>SITE PREPARATORY ACTIVITIES</u>

The site preparatory activities for the Pilot System included:

- i) The purchase of the Hazel Street property for construction of the control building
- ii) Surveying the layout of the Pilot System including the control building
- iii) Clearance of underground utilities
- iv) Submittal of and approval by the Town of Oyster Bay for excavation and road crossing plans
- v) Submittal of and approval by property owner's upon whose property various components of the remedy were to be installed
- vi) Mobilization of an office trailer and sanitary facility
- vii) Installation of a temporary construction fence along Hazel Street and South Oyster Bay Road and around individual work areas as needed
- viii) Pre-construction health and safety meeting with contractor personnel
- ix) Construction of a decontamination pad for drilling equipment contacting potentially contaminated soil

No site preparatory activities were required for the installation of the north fence well vaults (located on property currently occupied by Sleep's) and connecting

piping/conduits, except for the layout of the vaults and piping and a pre-construction health and safety meeting with the contractor. The reason for this is that the contractor retained by Sleepy's for the property redevelopment construction activities was already on Site and performing other construction activities.

The site preparatory activates for the remainder of the biosparge system included:

- i) Submittal of and approval by property owner's upon whose property various components of the remedy were to be installed
- ii) Surveying the layout of the connection between the north and middle fence
- iii) Clearance of underground utilities
- iv) Mobilization of a secure box container to store equipment
- v) Installation of a temporary construction fence around individual work areas as needed
- vi) Pre-construction health and safety meeting with contractor personnel
- vii) Construction of a decontamination pad for drilling equipment contacting potentially contaminated soil

3.3 AIR INJECTION DURATION / FREQUENCY

The air injection system is comprised of two injection well fences with eight and seven injection locations for the middle and northern fences, respectively (see Figure 3.1). Pursuant to the 100% Final Design Report, a minimum of six injection well nests at 100-foot centers were to be installed along each fence line. This objective has been met. Two air injection wells at different depths were installed at each injection location. The 100% Final Design air flow rate and injection frequency for each well was approximately 100 standard cubic feet per minute (scfm) for 8 hours twice per month following the initial oxygen saturation injection at each well which was expected to take on the order of 40 hours. Air injection during the time period when only the Pilot System was operational was performed weekly for 8 hours at 100 scfm at each well since the air compressor, which is sized for the entire biosparge system, had excess capacity available. This was done to ensure that the highly anaerobic conditions in the core of the VCM subplume were converted to aerobic conditions in as short a time period as practical. It is believed that the periodic stop/start of the injections results in better distribution of the injected air into the formation since a slightly different flow path will be created by each injection, thereby spreading the injection through more of the formation. Continuous injection is not needed since the groundwater only flows at a

rate of approximately 0.4 feet per day (ft/day) (12 feet/month) and sufficient air can be injected in a short time period to saturate the volume of water that surrounds each injection well. Air is pulse injected into each well on a rotating basis cycling between the deeper and shallower injection points.

Air injections in the Pilot System have continually been performed since October 2006 with only a few periods of non-injection (e.g., during periods of biosparge system performance monitoring, for various maintenance work, and during construction of the final system).

3.4 <u>INJECTION WELL LAYOUT/SPACING</u>

The injection well layout consists of two injection well fences (north and middle). The injection well nests along each fence line are set at a distance of approximately 100 ft Each injection well fence/individual well location injects the air into the concentrated VCM intervals in sufficient quantity to insure that the desired aerobic degradation conditions are created. By using this two fence layout, the treated water from the north injection fence will eventually migrate to the middle injection fence which will then allow the middle injection fence to cease operation. The intent will be to continue to operate the north fence of injection wells (or a portion thereof) until the two upgradient well nests (MW-92 and MW-93) and the monitoring wells within the north fence system approximately reach 40 µg/L of VCM. Similarly, the middle fence (or portion thereof) will continue to operate until the monitoring wells in the middle fence system approximately reach 40 µg/L. The exact time of appropriate compliance allowing shutdown of the north or middle fence (or portions thereof) will be recommended by GHSI to the EPA. EPA approval will be obtained prior to implementing any shutdown activity.

Once the injection systems have been turned off, the groundwater remedy will rely upon monitored natural attenuation to complete the degradation of VCM to the State drinking water standards or Federal MCLs.

The 100% Final Design fence lines were spaced approximately 700 feet apart (equivalent to approximately 5 to 7 years of groundwater travel time). Subsequent to EPA approval of the 100% Final Design Report and prior to installation of the north fence, the owner of the property on which the north fence was to be installed redeveloped the property in 2007/2008. The redevelopment necessitated the following actions:

i) Monitoring well nest MW-52 was abandoned

ii) The alignment of the north fence was moved approximately 250 feet to the south to be outside of the new building footprint and so as not interfere with property use (see Figure 3.1 for the revised alignment)

3.5 WELL INSTALLATIONS

3.5.1 INJECTION WELL INSTALLATIONS (SEE DRAWINGS CI-02, MP-01, MP-05, AND MP-06)

The wells for the Pilot System were installed between September 2005 and May 2006 and those for the remainder of the biosparge system were installed between September 2010 and May 2011.

The four injection well nests installed for the Pilot System are IW-16, IW-17, IW-18, and IW-19 (see Figure 3.1 for locations). The injection wells for the remainder of the system were installed in the following sequence to assist in determining the number of injection well nests in each fence:

- i) The wells in the center core of the VCM subplume were installed first at each fence line
- ii) Subsequent wells were installed out to the east and west edges of the VCM subplume until a VCM concentration of approximately $40\,\mu g/L$ or less was detected

The installation of the injection well nests along the north fence reached its western terminal point at IW-1 where the VCM concentration in one interval was $70\,\mu g/L$. The VCM concentrations in all the other sampled intervals at this location were non-detect. It is anticipated that the lateral dispersion of the injected air and mixing as the groundwater migrates will result in the delivery of oxygen to the groundwater west of IW-1. The eastern terminal point was reached at injection well nest IW-7 where the maximum VCM concentration in one sampled interval was $44\,\mu g/L$ and in the remaining sampled intervals was non-detect.

The installation of injection wells along the middle fence reached its western terminal point at IW-15 where the VCM concentrations were already less than $40 \,\mu g/L$. Nonetheless, an additional borehole was drilled and sampled at a location approximately 100 ft farther to the west for further confirmation of attainment of low level VCM presence. Based on the VCM concentrations being less than $40 \,\mu g/L$, a

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monitoring well nest (MW-86) was installed at this location. On the eastern end of the middle fence, injection wells IW-20, IW-21, and IW-22 were installed. It is expected that IW-22 is the east limit of the middle fence injection wells because the VCM concentrations at this well were less than $40~\mu g/L$.

The 6-inch diameter boreholes for the injection and monitoring wells were drilled using the rotary sonic method. A continuous soil core was collected and the entire core was screened for VOCs using a photoionization detector (PID). Geophysical logging of a select location (i.e., MW-92) was performed. The stratigraphic and geophysical logs are provided in Appendix B.

Groundwater samples were collected from approximately 50-foot intervals. The interval between collected groundwater samples was adjusted in some cases to take into consideration the results of the PID readings and the geology observed. Groundwater collection started at a depth of approximately 200 feet BGS for the north fence and approximately 300 feet BGS for the middle fence.

Groundwater samples were not collected from boreholes that were located within 25 feet of a borehole previously sampled (e.g., MW-83/VZ-10 which are located 20 feet downgradient of IW-16). Groundwater samples were only collected from the deepest borehole at each location that had multiple installations. The VCM concentrations detected in the groundwater samples collected during the drilling process are listed in Table 3.2. The VCM concentrations are presented on Figure 3.3 (north fence) and Figure 3.4 (middle fence).

The PID, groundwater, and geophysical results were reviewed to select the appropriate intervals for the installation of the well screens and to determine whether another well further out along that particular fence line was needed.

The depth of the boreholes drilled at each location was based on the measured depth to the bottom of the VCM subplume at each of the injection fences/wells location. Confirmation that the bottom of the VCM subplume had been reached was provided by the PID readings and the groundwater samples that were collected from or near the bottom of the borehole. This ensured that the borehole fully penetrated the VCM subplume and allowed the selection of the appropriate intervals in which to install the injection wells to ensure the complete thickness of the VCM subplume at each injection well nest location is being treated. The depth of the borehole typically extended approximately 50 feet below the measured bottom of the VCM subplume.

The injection points for the wells were strategically selected so that either gases or liquids can be injected into or just below the high concentration portion of the VCM subplume. The method of air injection relies on the pressure gradient created by the air injection to distribute oxygen vertically above the point of injection. It is most effective to inject air in between the fine-grained lenses that are present within the high VCM concentration subplume and also into the interval beneath the underlying fine-grained unit. Thus, two air injection points were used at each individual well that makes up the injection fence. The shallower air injection well screen was typically set at the base of the high permeability layer that contained elevated VCM concentrations. A second deeper air injection well, complete with its own screen, was installed approximately 20 feet below the base of the previously identified high permeability layer. This well screen was also set in a high permeability layer and is intended to provide upward cascading air through the entire overlying VCM impacted interval. Within the VCM subplume, the air is being injected into the bottom of the defined permeable interval (the permeable zone containing elevated VCM concentrations that is sandwiched between two low permeability layers). Injecting into the bottom of the permeable zone allows the air to rise and disperse as much as possible throughout the entire high concentration permeable interval. The reason for also injecting air below the fine-grained lenses that define the base of the high concentration VCM subplume is that such injection results in better areal distribution of the air. The air finds its own path around the lenses and bubbles up through the high concentration portion of the VCM subplume. Bubbling up of the air will occur as dictated by the slope of the underside of the discontinuous and randomly located clay lenses. Nonetheless, with the overlap of gaseous injections from neighboring injection wells along the fence, a continuous upward cascading curtain of gases has developed which spreads oxygen through the desired permeable unit.

To the extent possible, the air injection well screens were set at elevations above an identified underlying layer of PCE and TCE that was found beneath the VCM subplume originating from the Hooker/Ruco Site.

The vertical layout of the air injection and groundwater monitoring wells is shown on Figure 3.2 and the actual air injection well screen intervals are shown on Figures 3.3 and 3.4.

The Pilot System air injection well screens are 1-inch-diameter, 5-foot-long stainless steel and the riser pipes are 1-inch-diameter black steel.

In addition to the air injection well screens, each well nest was equipped with one liquid supplement injection well and screen. The setting for the 15-foot long screen (maximum) liquid supplement injection well was from just above the base of the high

permeability layer that has the highest VCM concentration. At this elevation, the base of the liquid supplement injection screen will be at approximately the same elevation as the top of the adjacent air injection screen. This will allow for maximum dispersion of the injected liquids by the air injections.

For liquids, it is more effective injecting directly into the high concentration VCM subplume. Mixing is assisted by the air injection process and also more significantly by the natural flow/dispersion forces that exist.

The Pilot System liquid injection well screens are 1-inch diameter, 10 to 15 feet long PVC, and the riser pipe is 1-inch diameter PVC. The Pilot System liquid injection wells were installed in the same sandpacked interval as the shallow air injection well.

Based on the results of the first year of performance monitoring of the Pilot System, the following changes were recommended in January 2008 for the remainder of the biosparge system injection wells:

- i) Increase the diameter of the water and air injection wells from 1 to 1.25 inch
- ii) Install the water injection well and shallow air injection well in separate sandpacked intervals
- iii) Install a steel plate on the bottom of the air injection wells to prevent settling of the wells
- iv) Install a spacer in the upper 0 to 20 feet of the injection well nests to maintain separation between the wells at the ground surface

The support for these recommendations was presented in the document entitled "Quarterly Report - Fourth Quarter 2007 (October through December) dated January 15, 2008. EPA acceptance of these recommendations was received on January 25, 2010. The wells for the remainder of the biosparge system were installed between September 2010 and May 2011 in accordance with these recommendations.

Well installation details are provided in Table 3.2 and well instrumentation logs are provided in Appendix B.

3.5.2 MONITORING WELLS

3.5.2.1 GROUNDWATER MONITORING WELLS

The locations of the groundwater monitoring wells are shown on Drawing CI-02. The majority of the monitoring points are located at approximately the midpoint between every other pair of injection wells. The middle fence mid-point wells are installed at a distance of approximately 50 feet downgradient of the injection wells. The north fence mid-point wells were installed at a distance of approximately 30 feet downgradient of the injection wells. This shorter distance was required due to space limitations along the southern property line of the Sleepy's property.

As shown on the Drawing, this layout results in four and three mid-point monitoring locations for the middle and north injection fence lines, respectively. The midpoint location was selected as the primary monitoring location since this is the location farthest from the injection point, and therefore the area least exposed to the injected materials. Thus these locations should be typical of worst case conditions. The monitoring well nests typically consist of two wells for the groundwater and two wells for the vadose zone. The exceptions to this are well nests MW-61, MW-76, and MW-85 each of which has four groundwater monitoring wells. The screened intervals of the groundwater monitoring wells were typically set at:

- i) An elevation equal to the mid-point between the top and bottom of the VCM subplume
- ii) In the next overlying sand unit above the VCM subplume

Cross-sections of the north fence and middle fence groundwater monitoring wells are shown on Figures 3.3 and 3.4, respectively. The groundwater monitoring well screens are 10 feet in length. Typical groundwater monitoring well details are shown on Drawing MP-05.

Furthermore, to provide an early indication of the impact of the biosparging system, groundwater monitoring wells were also installed approximately:

- 5 feet downgradient of the injection fence at the midpoint between adjacent injection wells at one location for the north fence and two locations for the middle fence
- ii) 20 feet immediately downgradient of an injection well (2± months travel time) at three and two locations for the middle and north fence, respectively

Existing wells located in appropriate locations (i.e., MW-61I, MW-61D, and MW-61D2 for the middle fence and MW-90D1 and MW-90D2 for the north fence), were included in the monitoring well network in lieu of new installations.

3.5.2.2 <u>VADOSE ZONE MONITORING WELLS</u>

Vadose zone wells were installed in the same locations as the groundwater monitoring wells installed at distances of 20, 30, and 50 feet downgradient of the injection fences.

Two vadose zone wells were installed at each location; one at a depth of approximately 8 feet BGS and one immediately above the groundwater table (approximately 50 feet BGS). The 8-foot depth was selected to be representative of a basement depth. The vadose zone wells were constructed of 1-inch diameter PVC pipe with screens 2 feet in length for the 8-foot deep wells and 5 feet in length for the wells just above the groundwater table. A longer well screen for the deeper vadose zone well was used to account for fluctuations in the groundwater table. The annulus of the borehole above the sandpack was sealed with a 2-foot bentonite pellet/chip seal overlain with cement grout containing 6 percent bentonite to prevent short-circuiting between wells and with the atmosphere. Typical vadose zone monitoring well details are shown on the Drawing MP-05.

3.6 FORCEMAINS (SEE DRAWINGS MP-01 THROUGH MP-08)

The injection well forcemains consist of two completely separate piping systems, one for the air supply and one for the water/liquid supply. The air portions of the forcemain system are wrapped (for corrosion resistance) Schedule 80 carbon steel pipe. High density polyethylene (HDPE) pipe (SDR11) was used for all direct buried underground forcemains that are used to distribute water, and potentially, liquid supplements throughout the system.

The forcemain piping layout is presented on the "As-Recorded" Drawings, a list of which is provided in Appendix A. Sizing of the liquid forcemain piping is based on maintaining a fluid velocity between 3 and 5 feet per second (based on 25 gpm) while at the same time maintaining a certain diameter pipe to allow easy cleaning during maintenance, if needed. Airline sizing is based on maintaining a minimum pressure drop in the pipe in order to minimize the size of the compressor.

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The maximum internal pressure at any point in the air forcemain piping system is not to exceed 200 pounds per square inch gauge (psig).

3.7 AIR/LIQUID DISTRIBUTING SYSTEMS (SEE DRAWINGS MP-01 THROUGH MP-08)

3.7.1 GENERAL

The primary components of the biodegradation remedy are the air distribution system and the liquid delivery system. The air distribution system feeding the injection wells consists of the following sub-systems:

- i) Air compressors
- ii) Air distribution forcemains
- iii) Control and power cables to the well points

The liquid distribution system consists of the following sub-systems:

- i) Liquid supplement mixing unit
- ii) Liquid amendment distribution forcemains
- iii) Control and power cables to the well points

For the air distribution system, the air is supplied by electric driven air compressors. The air compressors are housed in the control building. The control building also houses a liquid supplement mixing unit, a workstation for the operator, a washroom, and an equipment cleaning station. The structure is a prefabricated, insulated, and weathertight modular building, with approximately 1,000 square feet of space (e.g., 28 x 38 feet). The building was placed on a compacted gravel base for support and has one oversized door. The building is split into two main areas; one for the office and controls and one for the compressors and mixing unit. The office/control portion of the building has HVAC for heating and cooling while the equipment side only has heating and venting.

The air from the compressors is directly piped to each individual injection well head via a forcemain with appropriate valves at each individual well head. The main air supply forcemain consists of a 3-inch diameter steel pipe that is connected to each individual injection well via a 1 1/2-inch diameter steel pipe equipped with a motorized valve and flow meter. A supply forcemain constructed of 1 1/2-inch and 2-inch diameter HDPE

pipe was also installed to supply water and the liquid supplements, if needed. The main liquid supply forcemain is connected to each individual injection well via a 1 1/2-inch diameter steel pipe equipped with a motorized valve and flow meter. The air and liquid pipe networks are completely independent from each other.

The valves at each individual well head are activated from the control building. Control and power cables are linked from the control building to the well heads in separate 2- or 3-inch diameter conduits. Separate conduits were used so that the induced currents in the power cables do not create false signals in the control cables. The forcemains, conduits, and cables are of sufficient capacity to allow for the installation of injection wells at 50-foot spacings along each fence line, should the need for additional wells be necessary.

The airflow to the injection wells is controlled by a variable frequency drive (VFD) on the compressor and flow meter in the control building. The flow meter sends a signal to the controller which automatically controls the VFD to maintain a constant flow. If the flow falls below a set rate, an alarm will sound. Each injection well nest has two air injection points. Each point has an automatic control valve and flow meter to allow for fine tuning of the air flow, and a manual shutoff valve. The total flow from the control building can be directed down more than one well by opening one or more of the automatic valves. If more than one point is utilized at a time, the flow must be automatically adjusted at the wells to insure that each well is receiving the correct amount of air. The control system will continually adjust the air flow as needed due to the fact that slight differences in well screen elevations, as measured with respect to depth below the water table, can result in different pressures being required to depress the water table to the top of the well screen to allow the air to be injected into the groundwater formation. If the pressure differential between two wells is too large, the control system will ensure that the air will not preferentially be injected into the well that has the least height of water above it.

The liquid flow to the injection wells is controlled by a mixing unit, a control valve, and flow meter, which are also contained in the control building. The liquid supplement, if required, will be fed from the automatic mixing unit into the main water supply and then on to the wells. The flow meter will send a flow signal to the controller which will automatically control the valve to maintain a constant flow to the wells. If the flow falls below a set rate, an alarm will sound. Each well point has an automatic control valve, flow meter, and manual shutoff valve. The total flow from the control building can be directed down more than one well by opening one or more of the automatic valves. If more than one point is utilized at a time, the flow will be automatically adjusted at the

wells to compensate for pressure differences. Again, this will be necessary to insure that each open well is receiving the intended liquid supplement.

Water without supplements will be used to flush the pipeline after each liquid supplement injection to help prevent bio fouling of the supply lines, well screens, and the soils immediately adjacent to the well screen. The liquid supplements, which will be small in volume if used, will also be injected prior to air injection whenever possible so that the large volume of injected air will assist in the distribution of the liquid supplement in the groundwater formation.

EPA approval was received on August 4, 2006 to use treated groundwater from Northrop's GP-1/GP-3 treatment system as the water for the liquid supply system. The New York State Public Service Commission approved the supply of this treated water from Northrop to GSHI on November 13, 2006. A copy of this approval is included in Appendix C. This treated water is used as an additional supply of oxygen to the aquifer and to flush the liquid pipeline when supplements are injected. The advantages of using this groundwater are as follows:

- i) The treated water has a high dissolved oxygen content due to having been run through the Northrop treatment facility air stripper
- ii) The treated water has to be reinjected into the groundwater formation anyway under the rules and regulations of the local water district administration (at the present time it is reinjected at the ground surface)
- iii) The treated water is not chlorinated

Injection of the treated water to supplement the delivery of DO to the VCM-injected groundwater began on January 22, 2007. Injection has been continuous at a rate of up to 15 US gpm. The volume of treated water injected per month is provided in Table 3.4. As of August 31, 2012, 10,585,000 gallons have been injected. To date, the water that has been injected only includes oxygen since there has not been a need to provide supplements. In the future, if liquid supplements need to be injected and if the treated water is not available, city water will be used to prepare the liquid supplements.

As previously described, the control instruments for each well consist of a local flowmeter, pressure indicators, and an automatic valve. The operating status of the valve is displayed in the control room (e.g., open, closed or percent open). Also, each flow meter is equipped with a flow alarm to indicate if the well is not accepting flow. Injection pressures will be maintained below the formation rupture pressure.

Furthermore, to reduce potential silting of the well, air injections are applied and relaxed gradually over several minutes.

The main panel in the control building contains a Programmable Logic Controller (PLC) manufactured by Allen-Bradley to control the operation of the system. The PLC allows interfacing with an operator from a personal computer (PC) running a Human Machine Interface (HMI) software package by Genesis. An HMI is a graphical operator interface package that operates, in this case, under a Windows software operating system.

The controls for the Pilot System were upgraded in October 2008 to include an electric relay to protect the PLCs. The relays also allow the air and water injection cycles to operate automatically, eliminating unnecessary shutdowns.

The system runs in an automated mode and does not require an on-site operator. Operator presence at the facility was required during the initial set up, and will be required to respond to major alarms of the system, and for maintenance.

The operator initiates the injections from the PC, and the injection sequence continues until stopped from the PC by the operator or the controls measure an alarm condition (e.g., pressure too high) which will shut the system off. The sequence can also be programmed to start over once it has been completed. The PC also allows the operator to be able to change the timing of the air sparging and liquid injection sequences. The PC displays injection header pressure, flow rates, temperature, injection sequence status, and alarms. It is connected to a phone line to allow for remote access of the control system. The injection times and well sequencing can all be controlled and programmed at the HMI for complete automation and flexibility.

A security system was installed at the control center which is monitored 24 hours a day. The system monitors the power to the control room, fire/smoke detectors, entry detection sensors, and process alarms. In the event of an alarm or indication of a failure of the security system (security breach), the monitoring company contacts the appropriate personnel to take action.

3.7.2 COMPRESSORS

The main compressor is an Atlas-Copco Model No. GA-75VSD with VFD positive displacement screw drive capable of delivering 337 scfm at a pressure of 175 pounds per square inch (psi). The auxiliary compressor is an Ingersoll-Rand Model UP6-30 capable of delivering 100 scfm at a pressure of 175 psi. The auxiliary compressor was installed in

April 2010 to provide backup in the event that the Atlas-Copco Model is ever shut down for maintenance for an extended period.

The air is filtered by pre-filters and polishing filters to remove any water and oil that is carried over from the compressors prior to being injected into the ground. The air also passes through an air dryer to protect the instrumentation downstream of the compressor/dryer system.

3.7.3 SUPPLEMENT MIXING UNIT (MAKE-UP AND DELIVERY SYSTEM)

If needed, the mixing unit will be used to combine the liquid supplement (sugar byproducts) with water for transfer to the injection wells. The mixing unit includes a metering pump and mixing chamber. As of the date of this report, no liquid supplements have been needed or injected.

The supplement metering pump is capable of injecting concentrated sugar byproducts into the mixing chamber where it will mix with water prior to being injected into the ground. The mixing rate will be about 1 pound of sugar byproducts per 150 gallons of water (approximately 800 ppm). The supplement metering pump can pump up to 2 gallons per hour (gph) of concentrated sugar byproducts.

After mixing in the mixing chamber, the sugar byproducts solution will be injected into the forcemain (with additional feed water using the treated/aerated water from Northrop's GP-1/GP-3 treatment system) that feeds the wells to maintain a concentration in the groundwater of up to 25 mg/L (e.g., 5 gpm for 20 minutes each day). This feed rate will be revised as appropriate based on the performance monitoring results. The supplement injection pump has a capacity of 2 gph and can deliver the liquid supplement to 3 wells at a time, if so desired.

Mixing the supplements with a larger water volume and pumping at a higher rate substantially improves the mixing zone and assists in keeping the injected supplements at much lower concentrations. This, in conjunction with the fact that the treated water has elevated DO concentrations, reduces the chance for the creation of an anaerobic zone in close proximity to the liquid injection well.

3.8 INSTRUMENTATION AND CONTROL LOGIC (SEE DRAWINGS E-01 TO E-16)

3.8.1 GENERAL

The injection system's control logic is designed to allow the system to operate without supervision in a fail-safe mode. All control signals are fed to one PLC. The PLC supplies the appropriate responses to the signals using a PLC programming language. The PLC is located in the main control room in the control building. An operator can monitor and control the treatment system through the HMI. All process equipment can be shut down locally at the Site or remotely through the HMI. An emergency shutdown button is located at the HMI, which will shut down the entire injection system.

3.8.2 INJECTION WELLS

All inputs and outputs associated with the individual wells are routed to the PLC.

Each injection well has pressure indicators, flow meters, and control valves for the air injection and the liquid supplement addition. The flows and valve position are transmitted to the PLC for indication and alarming. These alarms and the valve positions are then displayed on the HMI computer screen.

3.8.3 SUPPLEMENT MIXING UNIT (MAKE-UP AND DELIVERY SYSTEM)

Supplements are pumped into the mixing unit and water is diverted into this unit to form a solution to be injected into the forcemain and from there into the injection wells.

A flow transmitter measures instantaneous combined flow from the mixing unit and water source to the injection wells. The instantaneous flow rate is displayed locally on the flow meter. The instantaneous flow rate is transmitted to the PLC and displayed on the HMI computer screen. Total flows are displayed on the instrument only.

The dosing rate of sugar byproducts is sent from the HMI to the mixing unit. The metering pump adds the correct amount of sugar byproduct to the mixing unit based on the required dosing rate and flow to the wells.

Following the mixing of the supplement in the mixing unit, the mixture is injected into the forcemain and mixed with the water source.

After the injection of the sugar byproducts into the water source, the mixture flows through an automatic flow control valve. This valve is operated by a Proportional/Integral/Derivative loop (PID loop) in the PLC based on the flow of the combined stream of water and sugar byproduct solution. As the flow rate deviates from a specified flow set-point, the PLC automatically adjusts an analog control signal to open/close the valve in order to compensate for the difference in flow. As the flow rate returns to the set-point, the PLC decreases the rate at which the analog control signal changes and attempts to maintain the valve's position. Overall, the PID loop adjusts the valve's position to maintain a constant flow to the injection wells.

Prior to water injection, any buildup of air/water pressure in the liquid injection wells is released into the storage tank located in the control building. Some groundwater is transmitted to the storage tank during the pressure release. The pressure release is required since the pressure of the water supplied by Northrop is sometimes lower than the pressure in the liquid injection wells. The pressure release decreases the pressure in the well system to allow the water supplied by Northrop to flow into the liquid injection wells.

Flow to the wells is measured by a flow transmitter which displays instantaneous flow locally. The flow rate is transmitted to the PLC and also displayed on the HMI computer screen.

Additional flow control at each individual well is maintained using the same philosophy as above, for the supplement mixing unit.

3.8.4 AIR DELIVERY SYSTEM

Air (the source of oxygen) from the compressor flows from the control building to the injection wells.

A flow transmitter measures instantaneous flow and temperature of the air leaving the compressor as it is injected into the injection wells. The instantaneous flow rate and temperature are displayed locally on the flow meter. The instantaneous flow rate and temperature are transmitted to the PLC and displayed on the HMI computer screen. Total flows are displayed on the instrument only. Only one of the two compressors operates at any given time.

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The main compressor speed is controlled by a VFD. This VFD is operated by a PID loop in the PLC based on flow from the compressor. As the flow rate deviates from a specified flow set-point, the PLC automatically adjusts an analog control signal to "ramp up" or "ramp down" the speed of the compressor in order to compensate for the difference in flow. As the flow rate returns to the set-point, the PLC decreases the rate at which the analog control signal changes and attempts to maintain the compressor's speed. Overall, the PID loop adjusts the compressor's speed to maintain a constant air flow to the injection wells.

At the discharge of the compressor, the air flows through an automatic flow control valve. This valve is an open/closed valve used for system isolation during a shutdown condition. This valve is operated by signal in the PLC based on a permissive from the PLC. As the flow, temperature, or pressure deviates from specified set-points, the PLC automatically shuts down the compressor and closes the valve. The operator will be required to determine the problem prior to restarting the system.

Additional flow control at each individual well is maintained using the flowmeter and the control valve at the well. A PID loop controls the flow valve as described above.

3.8.5 <u>ELECTRICAL (SEE DRAWINGS E-01 TO E-16)</u>

3.8.5.1 **GENERAL**

The electrical design provides for the project electrical loads and conforms to the latest requirements of ANSI/NFPA 70 "National Electrical Code" and ANSI/IEEE C2 "National Electrical Safety Code".

The electrical drawings are included in Appendix A.

3.8.5.2 <u>SAFETY CONSIDERATIONS</u>

All electrical equipment and systems are designed and constructed to meet the following minimum safety requirements:

- i) Electrical equipment and material have adequate current carrying capacity, short circuit, and Basic Impulse Insulation Level (BIL) interrupting and/or withstand ratings
- ii) Equipment and device enclosures are of a dead front type

- iii) Non-current carrying electrical equipment exposed metallic parts (such as enclosures, raceways, etc.) are grounded
- iv) Equipment and device enclosures are properly identified and, where required, are supplied with the rating nameplates
- v) Sufficient access to and working space around all electrical installations will be maintained to provide for ready and safe operation, and to allow for equipment maintenance
- vi) Electrical classification of all work areas is non-hazardous

3.8.5.3 PROJECT LOADS

The project electrical loads consist of the process equipment motors, heat tracing, HVAC, lighting, process instrumentation, controls, communication equipment, and other similar items.

The project loads require 480-volt (V), 277-V, 208-V, and 120-V, 60 hertz (Hz) power supplies. The power originates in the control building and is distributed to the well vaults as needed.

3.8.5.4 POWER SERVICE

The designated power service is located in the control building. It is provided by the local power provider operating in the project area.

The power service is a 480 VAC, 3-phase, 4-wire solidly grounded system. It is sized to the project power load requirements and it does provide for the anticipated power load growth.

The service entrance arrangement is in accordance with the power service provider specifications.

3.8.5.5 POWER DISTRIBUTION AND CONTROL EQUIPMENT

The project power distribution and control equipment consist of a 480-V service panel, 480-V-208/120-V step-down transformers, 208/120-V distribution panel boards, low

voltage motor controllers, and safety switches. All power equipment and control is located in the areas designated on the Drawings.

3.8.5.6 **LIGHTING**

The lighting provides adequate illumination in the operation areas, and will supply the required illumination in emergency situations. Lighting is provided as follows:

- i) Project lighting includes the outdoor and indoor lighting systems
- ii) The outdoor lighting at the control building consists of high intensity discharge (HID) lights which are photo-electrically controlled with manual over-ride
- iii) The indoor lighting consists of a mixture of HID and fluorescent lights, self-contained individual emergency lighting units, and exit signs as follows:
 - a) The HID and fluorescent lights are manually controlled
 - b) The emergency lighting units are strategically located to illuminate passages to the exit doors and illuminate automatically in the case of indoor general lighting failure
 - c) The exit signs are battery supported and are placed in strategic locations to direct occupants to the doors

3.8.5.7 CONVENIENCE OUTLETS

120V AC convenience outlets are furnished at accessible locations in operational areas of the facility to provide power for portable lighting and small tools.

3.8.5.8 **WIRING**

Wiring is provided to interconnect all project electrical, instrumentation, communication equipment, and loads.

The project wiring falls into one of the following three categories:

i) Low voltage power and control wire and cable for the project power and control equipment and loads

- ii) Instrumentation cable for the project instruments
- iii) Data communication cable for the project data communication network

The project wiring is carried in cable trays and conduits and meets all specified application and environmental conditions.

3.8.5.9 GROUNDING

Grounding to provide for the electrical system grounding requirements, lightning protection system, and personnel safety consists of ground rods and interconnecting grounding cable. The grounding is designed to obtain a maximum of 5 ohms resistance to ground.

3.8.5.10 OVER-VOLTAGE PROTECTION

Over-voltage protection is provided against voltage surges induced by lightning, equipment switching, and other sources of voltage transients. All project power equipment has the proper BIL ratings, and transient voltage surge suppression devices are provided.

3.9 CONTROL BUILDING (SEE DRAWING CI-02 THROUGH CI-04 AND ST-01 THROUGH ST-07)

The control building is a 1,064-square-foot one-story pre-engineered structural steel building designed in accordance with the Building Code of New York State. The building is designed as Facility-Industrial with Occupancy Code of Use Group F-2. The building construction material classification is non-combustible Type 2B.

The control building consists of the main service area and a control room/lavatory. The building is 28 feet by 38 feet with an eave height of 14 feet 6 inches above its floor level. The control room area is 13 feet by 26 feet 8 inches, and located in the eastern part of the control building. The building roof is at a 2:12 slope directing precipitation/rainwater from the roof to the ground surface adjacent to the building. The ground around the building is graded to direct rainwater away from the building.

The building is a rigid framed steel structure with a single clear span, straight (non-tapered) columns and gabled roof beams. The building roof and walls have

insulated pre-finished metal panels. Pre-finished interior liner panels of limited height are installed along the building perimeter walls. The interior wall between the control room and treatment area is 4-inch insulated gypsum board.

Access to the service area of the building is provided through a 6-foot by 7-foot double door. The control room is accessed using a 3-foot by 7-foot man door from the service area.

The control room includes a motor control center and a lavatory. The electrical equipment and instrumentation are wall or floor mounted as shown on the Drawings. The lavatory is intended for occasional use.

The mechanical piping in the service area is supported using steel pipe supports mounted on the building floor. Electrical conduits are wall or building ceiling supported. The process equipment is supported by a reinforced concrete floor slab.

The building floor is a reinforced concrete slab-on-grade. The building foundations are continuous reinforced concrete wall footings.

The heating system for the control building maintains an inside temperature of 55 degrees Fahrenheit (°F) based on an ambient outside temperature of 11°F. One electric unit heater with diffusers to distribute heat is located in the building for this purpose. One combined louver/shutter and one panel fan are furnished for ventilation. The ventilation system provides a minimum of one air change per hour, or an induced ventilation exhaust of at least 1 cfm per square foot of floor space. The control room is equipped with a through-the-wall air conditioner/heater unit. An exhaust fan is installed in the lavatory.

The building is categorized as light (low) fire hazard and is equipped with portable fire extinguishers (Class ABC) to provide fire protection.

3.10 UTILITIES (SEE DRAWINGS CI-02 THROUGH CI-06 AND MP-01 THROUGH MP-14)

3.10.1 GENERAL

The utilities include potable water, sanitary, electrical power, and phone service.

3.10.2 POTABLE WATER

Potable water supply is required for the hose stations and the lavatory and is required as a back-up supply for the liquid injection system should the treated groundwater from Northrop's GP-1/GP-3 system not be available. The source of potable water supply is the water main located on the north side of Hazel Street. A pressure of 30 to 70 psi is available at the water main. A new 2-inch diameter water service line was installed, extending from the water main to the control building.

3.10.3 SANITARY

The municipal sanitary sewer on Hazel Street was tapped into to provide sanitary sewer discharge for the control building.

3.10.4 <u>ELECTRICAL</u>

The power service required for the biosparge is described in Section 3.8.5.4.

3.10.5 PHONE SERVICE

The control building is provided with two voice grade phone lines. One line is connected to the building telephone and control panel Autodialer. In the event one of the monitored points on the Autodialer goes into alarm, it will capture the phone line and make the appropriate emergency call outs. The second line is connected through a modem to the control PLC so that calls can be made into the control center for troubleshooting purposes.

3.11 WATER AND EXCESS SOIL HANDLING

Water generated by well installation, development, and purging, and equipment decontamination activities was discharged to the Cedar Creek Water Pollution Control Plant (WPCP) in accordance with the approvals received from the Nassau County Department of Public Works.

Excess drill cuttings for the Pilot System wells and sediment from well development and equipment decontamination activities were disposed of at the BFI Conestoga Landfill

located in Morganstown, Pennsylvania. The excess drill cuttings and sediment for the remainder of the Biosparge System were disposed at the GROWS Landfill located in Morrisville, Pennsylvania.

Excess soil excavated during excavation of the control building and Pilot System injection well vaults and conduit/forcemain trenches between these injection well vaults were transported to the Hooker/Ruco Site and used by Bayer as backfill.

Excess soil excavated during excavation of the north fence well vaults and conduit/forcemain trenches between these injection well vaults were left on the Steel Equities/Sleepy's property prior to construction of the parking lot.

Excess soil excavated during construction of the vaults for middle fence injection wells IW-20, IW-21, and IW-22 and the conduit/forcemain trenches between these injection well vaults were left on the Northrop Property. Excess soil from IW-15 and the trenches to connect the north and middle fences were placed on the Bayer property.

3.12 <u>PERMITS/NOTIFICATIONS</u>

3.12.1 <u>BUILDING PERMITS/CERTIFICATES</u>

Permits obtained from the Town of Oyster Bay for the construction of the control building were as follows:

- i) Area Variance;
- ii) Construction Permit:
 - a) Electrical Sub-Code
 - b) Plumbing Sub-Code
 - c) Fire Protection Sub-Code
 - d) Building Sub-Code

Prior to the use of the biosparge system and occupying the control building, the following certificates were obtained:

- i) Electrical Approval Certificate
- ii) Certificate of Approval of Plumbing
- iii) Certificate of Occupancy

Copies of these certificates are included in Appendix C.

3.12.2 INJECTION PERMITS AND OPERATING PERMITS

At the present time, there are no known permits required for the air injection system.

The liquid amendment injection wells are Class V injection wells. As such, they are "permitted by rule" wells and no permit is needed. The applicable regulatory requirements for Class V wells pursuant to §144.27 include the submission of the installed well details and the periodic submission of monitoring (e.g., groundwater and soil gas) and injection fluid analysis results. The installed well details are included in Appendix B. Groundwater quality data are periodically submitted by GSHI to the EPA and DEC. Injected water quality data are periodically submitted by Northrop to the DEC.

Groundwater collected in the storage tank from the injection wells during pressure releases is periodically discharged to the Cedar Creek WPCP in accordance with the approvals received from the Nassau County Department of Public Works.

3.12.3 <u>NOTIFICATIONS</u>

Notice was provided via the First Quarterly Progress Report - Third Quarter 2006 (August and September) dated October 4, 2006 to the EPA, DEC, and Nassau County the first time injection occurred for the Pilot System. The startup and first injection for the remainder of the biosparge system occurred in September 2012.

4.0 CHRONOLOGY OF EVENTS

In summary, the primary activities performed since signing of the ROD, are listed below:

Date Activities

Sept. 29, 2001	OU-3 ROD finalized by EPA	
Apr. 26, 2001	Administrative Order issued	
Feb. 8, 2002	OU-3 Pre-Design Activities Scope of Work approved by EPA	
Feb. to Nov. 2002	OU-3 Pre-Design Activities performed	
Apr. to Sept. 2002	Supplemental Treatment System for Northrop GP-1/GP-3	
	Treatment System constructed	
Nov. 22, 2002	Off-site Groundwater Pre-Design Information Report (PDIR) submitted to EPA	
Mar. to July 2003	Responses to EPA comments on PDIR submitted	
July 29, 2003	EPA approves PDIR and designates the PDIR as the 30% Design Report	
Sept. 2003	Lag bed of Supplemental Treatment System converted to	
1	potassium permanganate to treat VCM more efficiently	
Oct. 31, 2003	Pre-final (95%) Remedial Design Report Submitted to EPA	
Apr. 2004 to	Responses to EPA comments on 95% Design Report submitted	
May 2005		
May 27, 2005	Final 100% Design Report submitted to EPA	
July 7, 2005	Final 100% Design Report approved by EPA	
Aug. 2005 to	Biosparge Pilot System wells installed	
May 2006		
Nov. 2005 to	Biosparge Pilot System Control Building and underground	
Oct. 2006	components installed and tested (start up)	
Sept. 14, 2006	Pilot System Pre-Final Inspection performed	
Oct. 27, 2006	Pilot System Final Inspection performed	
	Pilot System starts full-time operation	
Feb. 1, 2007	Pilot System As-Built drawings, well stratigraphy and	
	instrumentation logs, draft O & M Manual, and HASP submitted to EPA	
Jan. 16, 2008	Recommended modifications to the Biosparge System design and operation submitted to EPA	
Sept. to Dec. 2008	The underground components (excluding wells) for the Biosparge System north fence installed	
Aug. 27, 2009	EPA comments on the Biosparge System progress reports, the draft	

Date	Activities	
	O & M Manual and the HASP received	
Sept. 23, 2009	Responses submitted to EPA on the August comments	
Nov. 30, 2009	Information supporting effectiveness of the Biosparge System submitted to EPA	
Jan. 25, 2010	EPA agreed that biodegradation of VCM was occurring and	
	requested north and remainder of the middle fence construction be started in 2010	
Sept. 2010 to	Remainder of Biosparge System Wells installed.	
May 2011		
Sept. 22, 2011	EPA concurrence received allowing use of PDB/Hydrosleeve	
	samplers for future groundwater sampling events	
Oct. 24, 2011	Updated QAPP submitted to EPA	
Dec. 2011 to	Responses submitted to EPA comments on the updated QAPP	
Apr. 2012		
Apr. 13, 2012	Revised QAPP submitted to EPA	
Feb. to Aug. 2012	Remainder of Biosparge System installed and tested	
July 27, 2012	Biosparge System Pre-Final Inspection performed	
Aug. 9, 2012	Draft Remedial Action Report submitted to EPA	
Sept. 12, 2012	Biosparge System Final Inspection performed	
Sept. 17, 2012	Biosparge System began full-time operation	

An expanded list of activities is provided in Table 3.1

As noted in Section 2.2, it is estimated that the cleanup goals are projected to be met in approximately 12 years after the start of full-time operation of the entire biosparge system.

5.0 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

5.1 PERFORMANCE MONITORING

As previously stated in Section 2.2, the parameters to evaluate the performance of the biosparge system are:

- Dissolved Oxygen (DO): desired groundwater concentration of >2 milligrams per liter (mg/L)
- Total Organic Carbon (TOC): desired groundwater concentration of 5 ≤ TOC ≤ 10 mg/L
- VCM: decreasing concentrations

Of the above three parameters, the VCM concentration is the critical parameter. If the VCM concentrations are decreasing and are consistent with meeting the remedial objectives, the need to achieve the desired concentrations for DO and TOC is not imperative.

Performance monitoring of the Pilot System has been performed since October 2006. The results and QA/QC reviews of the results have been submitted to the EPA with the progress reports as the data was validated. The DO, total VOC (TVOC) and VCM concentration trends for the individual Pilot System groundwater monitoring wells are shown in Figure 5.1 through 5.7. The results show that the biosparge technology is achieving the remedial objectives in the area of the Pilot System.

5.2 <u>CONSTRUCTION QUALITY ASSURANCE</u>

Construction of the biosparge system was performed in compliance with the quality assurance program described in the Construction Quality Assurance Plan (CQAP) provided in Appendix E of the 100% Final Design Report. The program included:

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- i) Project meetings
 - Pre-Construction Meetings
 - Daily Tailgate Meetings
 - Weekly update meetings
 - Pre-Final Inspection

- Final Inspection
- ii) Inspection and testing activities
 - Daily inspections
 - Pressure testing of forcemains
 - Continuity testing of electrical circuits
- iii) CQA documentation
 - CQA instrument calibration
 - Inspection results
 - Testing results
 - Problem/corrective actions

All CQA documents are being retained by CRA in accordance with the Administrative Order.

No substantial problems or deviations of the program occurred during construction.

5.3 **ANALYTICAL DATA QUALITY**

The performance monitoring analytical results and the QA/QC reviews of the results have been submitted with the appropriate progress reports upon validation of the data. In general, the data have been acceptable with minor qualifications as described within each QA/QC review report.

Sample collection and analyses prior to the November 2010 performance monitoring event were in accordance with the procedures presented in the OU-3 QAPP (100% Final Design Report, Appendix G). As a pilot test, Passive Diffusion Bags (PDBs) were placed in four of the 15 biosparge performance monitoring wells for the semi-annual sampling event that was performed for the second half of 2010. The PDBs were installed on November 15, 2010. Low Flow Purging (LFP) techniques were used to collect the samples from the remaining 11 wells in the monitoring program. These samples were collected between November 15 and 24, 2010. In accordance with the sampling protocols provided in the QAPP Addendum approved on October 26, 2010, the PDB samples were removed from the wells on November 29. Only one of the PDBs was successfully removed (and submitted for analysis). The remaining three PDBs were locked into the well and had to be removed with the driller's assistance. In response to the locked-in samplers, the QAPP Addendum was revised and approved by the EPA on

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March 22, 2011 for the collection of samples from the same four wells using smaller diameter PDB and HydraSleeve[™] samplers. Groundwater samples for the April 2011 performance monitoring event were collected using LFP methods from all 15 Pilot System monitoring wells and by PDB/HydraSleeve[™] sample for four wells. An evaluation comparing the results of LFP sample results to PDB/HydraSleeve[™] sampler results was submitted to the EPA on August 31, 2011. The data showed good correlation between the two sampling methods. This submittal also requested the use of PDB/HydraSleeve[™] samplers be approved for future groundwater sampling events. EPA approval of the request was received on September 22, 2011. Groundwater sample collection for the November 2011 and April 2012 performance monitoring events were performed and subsequent events will be performed using PDB and HydraSleeve[™] samplers in accordance with the procedures in the updated QAPP submitted on October 24, 2011 (revised April 13, 2012).

5.4 NOISE SURVEY

A noise survey was performed on January 8, 2007 within the control building to determine if sound protection for people working within the building was needed. The highest noise reading was 77.4 dB which occurred in the bathroom with the air vent fan running and the toilet flushing (a common household occurrence). Thus, no hearing protection or signage regarding high noise levels are needed.

6.0 <u>BIOSPARGE SYSTEM INSPECTIONS AND CERTIFICATIONS</u>

6.1 <u>PILOT SYSTEM</u>

6.1.1 PRE-FINAL INSPECTION

CRA and Camp, Dresser & McKee (CDM) personnel performed the Pre-Final Inspection for the Pilot System at the Site on September 14, 2006. CDM was contracted by the EPA to provide oversight of the remedial activities at the Site. One minor item (i.e., the amendment pump) was not operational during the Pre-Final Inspection as an electrician was working on the circuitry. During the inspection:

- i) All of the process equipment and piping was hydrostatically tested
- ii) All of the instrument and electrical loops were checked
- iii) All instruments were calibrated
- iv) The communication between the systems and PLCs was verified

6.1.2 FINAL INSPECTION

CRA and CDM personnel completed a Final Inspection of the Pilot System at the Site on October 27, 2006.

The Final Inspection included:

- i) An inspection of the biosparge system
- ii) A tour of the Site building and the injection vaults
- iii) Instruction on the operation of the system
- iv) A comprehensive review of the various HMI menus and injection sequences
- v) The air compressor was started and allowed to operate

The water injection was not initiated during the Final Inspection because approval for the use of treated water from the Northrop Grumman GP-1/GP-3 treatment system had not yet been received from the Public Service Commission. The water injections were subsequently approved by the Public Service Commission and have been occurring since January 22, 2007.

The air injection system was operating at that time. It was agreed that the Pilot System passed the Final Inspection and was ready for operation.

6.2 REMAINDER OF BIOSPARGE SYSTEM

CRA, GSHI, and EPA personnel performed the Inspections for the final biosparge treatment system.

6.2.1 PRE-FINAL INSPECTION

The Pre-Final Inspection was performed on July 27, 2012. The Pre-Final Inspection included:

- i) An inspection of the biosparge system
- ii) A tour of the control building and the injection vaults

At the time of the inspection, all construction activities were complete except for minor electrical work needed in two of the vaults. The main compressor was in the process of being repaired. CRA personnel were testing the control systems and the mechanical components of the system.

6.2.3 FINAL INSPECTION

The Final Inspection was held on September 12, 2012. The Final Inspection included:

- i) Instruction on the operation of the system
- ii) A review of the various HMI menus, injection sequences, and alarms
- iii) The air compressor was operating during the inspection

The entire system is now operational and full-time operation started on September 17, 2012.

6.3 HEALTH AND SAFETY

Construction of the biosparge system was performed in compliance with the procedures described in the HASP provided in Appendix F in the 100% Final Design Report. Operation of the Pilot System was performed in compliance with the procedures described in the HASP provided as Appendix L in the Draft Operation, Maintenance, and Monitoring (O,M & M) Manual submitted February 1, 2007. No substantive problems or derivation from the procedures occurred.

Operation of the entire biosparge system after August 2012 is being performed in accordance with Appendix L of the updated O,M & M Manual.

6.4 <u>CERTIFICATION STATEMENT</u>

To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Roger Smith	Senior Project Manager
NAME	TITLE
Pos Amits	September 26, 2012
SIGNATURE	DATE

7.0 OPERATION AND MAINTENANCE ACTIVITIES

7.1 LICENSING REQUIREMENTS

There are no known licenses or permits required to operate the biosparge treatment system. Approval to discharge waters to the Cedar Creek WPCP was received as needed. The most recent approval was received on March 11, 2010 for a 3-year time period.

7.2 OPERATION, MAINTENANCE AND MONITORING

A draft O,M & M Manual for the Pilot System was submitted on January 31, 2007. The updated final O,M & M Manual for the entire biosparge system was submitted in September 2012. The O,M & M Manual includes an updated HASP which covers the O,M & M activities.

The O,M & M Manual addresses the long-term operation, maintenance, and monitoring of the biosparge system. The O,M & M Manual provides a summary of the requirements for the various components of the system.

A summary of the basis of the O,M & M Manual is provided in the following paragraphs.

Operator presence is required on a periodic basis when the system is in full-scale operation. The system is designed to operate unsupervised, with the PLC monitoring key parameters for proper operation. Should an operating parameter be out of range, the system will attempt to adjust for it or if necessary shut down the process safely, while notifying the operator of the shutdown. The system cannot be started up remotely following a major alarm. The operator will have to go to the facility, evaluate the problem, and make corrections, prior to restarting the system. The operator will receive a summary of system operations from the PC HMI hooked up to the PLC. Information related to instrumentation readouts (i.e., process equipment and piping) and any alarms will be provided on the HMI. The operator will check the system's operation, log data, and sample as necessary. The PLC is designed to assist in the accumulation, storage, and trending of operating data. The operator is also responsible for the maintenance of the building and equipment.

7.3 HEALTH AND SAFETY

The health and safety procedures for the operation and maintenance of the system are in accordance with those presented in the HASP included as an appendix in the O,M & M Manual for the entire biosparge system.

7.4 PERFORMANCE MONITORING

Performance monitoring includes groundwater and vadose zone monitoring and process monitoring. Additional details regarding the scope of the monitoring is provided in the following sections. A summary of performance monitoring is shown in Table 7.1. All Pilot System monitoring and analytical results and QA/QC reviews have been provided to the EPA in prior submittals and these are not included in this report. The frequencies of sampling described below are applicable to each fence section.

7.4.1 GROUNDWATER MONITORING

The groundwater monitoring well network consists of three groups of well nests:

- Middle Fence: four well nests located approximately 50 feet downgradient of the mid-point between adjacent injection well nests
 North Fence: three well nests located approximately 30 feet downgradient of the mid-point between adjacent injection well nests
- ii) Well nests located approximately 5 feet downgradient at the mid-point between adjacent injection well nests (one for the north fence and two for the middle fence)
- iii) Wells nests located approximately 20 feet immediately downgradient of an injection well nest (two for the north fence and three for the middle fence)

The distance of 50 feet for the middle fence mid-point wells is equivalent to approximately 4 months of groundwater travel time. Thus, these wells were monitored quarterly for the first year of operation and semi-annually thereafter. The distance of 30 feet for the north fence wells is equivalent to approximately 2 months of groundwater travel time. Thus the mid-point north fence wells and the new mid-point middle fence well (i.e., MW-89) will be monitored quarterly for the first year of operation and then semi-annually thereafter.

The Pilot System wells, located approximately 5 feet downgradient, were monitored monthly for the first quarter of operation to assess the oxygen distribution and evaluate the zone of biosparging influence. Thereafter, all the Pilot System groundwater monitoring wells located 5 and 20 feet downgradient were monitored quarterly for a period of 2 years after startup of operation and semi-annually thereafter. All groundwater monitoring wells for the remainder of the biosparge system will be monitored quarterly for the first year of operation and semi-annually thereafter.

Initially, the groundwater was monitored for VOCs (including TICs), TOC, N, P, and the natural attenuation parameters, DO, ORP, pH, temperature, conductivity, and ferrous iron (Fe⁺²). VOC TICs were analyzed and reported for the groundwater samples collected from the first sampling event of each new well installed and the next sampling event from any existing well. If TICs were present in a well, TICs were continued to be analyzed/reported for the subsequent samples from each well until they were no longer present. For wells in which no TICs were present, no additional analysis/reporting of TICs was performed. In addition, heterotrophic microorganisms were analyzed annually for the first 2 years for the Pilot System wells and will be similarly analyzed for the first 2 years for the remainder of the biosparge system groundwater monitoring wells.

Prior to the start of air injection at each section of the injection well fence, baseline monitoring was performed at the appropriate wells. The frequency of the baseline monitoring for the Pilot System was as follows for the general chemical analyses:

- 2 weeks prior to the initial air injection
- 3 days prior to the initial air injection
- 2 days prior to the initial air injection
- 1 day prior to the initial air injection

Each well was analyzed for VOCs and TICs on only one of these four baseline dates. Since the intensive Pilot System pre-start monitoring did not identify any significant differences in groundwater concentrations or conditions over the time period of the baseline sampling, baseline sampling for the remainder of the biosparge system was performed only once before the start of air injection. The parameters analyzed/monitored for the baseline events were the same as those described above.

7.4.2 VADOSE ZONE MONITORING

Vadose zone wells were installed in the same locations as the groundwater monitoring wells and were monitored at the same frequency as the groundwater monitoring wells.

Soil gas samples have been and will continue to be collected for laboratory analysis of VOCs and methane. The results for the Pilot System have been provided in the progress reports submitted to the EPA. The samples were and will be collected semi-annually for a period of 2 years at each portion of the biosparge system as that portion becomes operational. In addition, the air immediately above the ground surface at each injection well has and will continue to be periodically monitored using a PID to determine if short-circuiting up the well annulus is occurring. Short-circuiting will be evidenced by a PID reading >10 ppm above background. An ambient air sample will be collected at ground surface near the shallow vadose zone well which had the highest reading greater than 10 ppm above background, if such reading occurs. To date, no ambient air samples were needed to be collected.

The soil gas and ambient air sample results will be compared against the short-term SGC values (e.g., $180,000 \,\mu g/m^3$ for VCM). The short-term values were selected because the biosparge system is being installed in open areas on which only the occasional person traversing the area to get from one location to another is present. Sample collection and analyses will be performed in accordance with the procedures presented in the updated OU-3 QAPP.

7.4.3 PROCESS MONITORING

Injection header pressure and temperature as well as injection on/off cycle times and quantities of materials injected are being monitored and stored by the HMI software on the PC. In addition, in accordance with 40 CFR 144.27, the liquid supplements will be sampled and analyzed prior to their use, if needed (TOC for the sugar by-product solution and phosphorus and nitrogen for the DAP). The data will allow estimates to be made of the quantities of materials injected at each point (i.e., the quantity of an injected gas is a function of volume, pressure, and time). These mass estimates will be used to evaluate the distribution of the injected materials at each injection point and, in conjunction with the soil gas and groundwater monitoring, will be used to assist in optimizing the timing, locations, and rates of material injection. The data will be used to assess the rate of VCM biodegradation, injection material distribution and migration, and monitor groundwater flow pathways.

7.5 REMEDY LOGIC

The remedy logic is based upon the redox conditions, VCM concentrations, and TOC concentrations measured in the monitoring wells in the vicinity of the injections. The primary goal of the injections is to create an aerobic environment. The collected data will be used to assess what actions may be necessary to improve the remedy.

Dissolved Oxygen

- The desired concentration is >2 mg/L
- If <2 mg/L, the options are:
 - Increase the length of time of oxygen injection
 - Increase the frequency of oxygen injection
 - Increase the volume of oxygenated water injection
 - Install an additional injection well at the midpoint between the injection wells

TOC

- The desired concentration is $5 \le TOC \le 10 \text{ mg/L}$
- If <5 mg/L, the options are:
 - Increase the injection volume
 - Increase the injection frequency
 - Check whether the VCM concentration is decreasing
 - Evaluate other injection materials

VCM

- The measured concentrations should be decreasing
- If not decreasing:
 - Increase the dissolved oxygen and/or TOC concentration
 - Install additional injection wells at the midpoint between the injection wells
 - Install additional injection wells at strategic locations in the south portion of the subplume

Of the above three parameters, the VCM concentration is the critical parameter. If the VCM concentrations are decreasing and are consistent with meeting the remediation objectives, the need to achieve the desired concentrations for DO and TOC is not imperative.

7.6 EVALUATION/MODIFICATION OF MONITORING PROGRAMS

The scope of the groundwater monitoring and vadose zone monitoring will be evaluated 2 years after the entire biosparge system is operational (in 2014) and thereafter at 3-year intervals. Based on the evaluation, the scope of monitoring may be modified for the next 3-year period. EPA concurrence will be obtained prior to implementation of any modifications.

7.7 REPORTING

The reporting schedule shall be:

- i) Quarterly progress reports with Region 2 EDD format submittal of sampling data until 1 year after startup of the remainder of the biosparge system (September 2013)
- ii) Semi-annual progress reports thereafter
- iii) The Final O,M & M Manual for the Biosparge System to be submitted in October 2012.

The quarterly and annual progress reports will contain validated biosparge system performance monitoring data as they become available.

7.8 <u>INSPECTIONS</u>

It is anticipated that inspections will be performed by the EPA on an as-desired schedule as O, M & M is ongoing.

7.9 POTENTIAL PROBLEMS WITH FUTURE BIOSPARGE SYSTEM OPERATION

This section describes some of the potential problems that may occur in the future with the biosparge system operations. The currently foreseen potential problems are:

i) Failure of selected system components (e.g., valves, actuators, flow meters, etc.). Spares have been purchased and are on-Site to expedite system repairs should the need arise.

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ii) Plugging of injection well screens. This has previously occurred and the injected wells were redeveloped. When well plugging occurs in the future, the wells will be videoed with a downhole camera to determine the cause of the plugging (e.g., infilling with sediment, encrustation of the well screen with precipitated, etc.) and the appropriate well rehabilitation method will be used.

As previously stated in this report, problems with the main compressor have occurred in the past and are possible in the future. To address this potential, an auxiliary compressor has been purchased and installed.

8.0 OBSERVATIONS AND LESSON LEARNED

Observations and lessons learned have been described in previous sections of the report. They are summarized in the following:

Based on the results of the years of performance of the Pilot System, the following changes were included in the design of the remainder of the biosparge system injection wells:

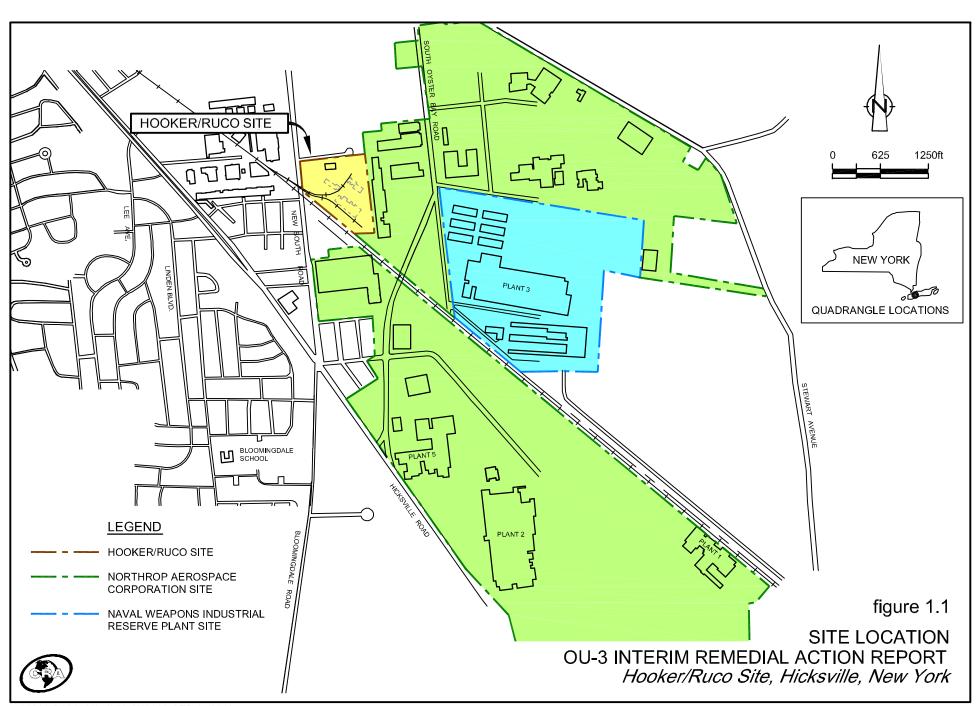
- i) Increase the diameter of the water and air injection wells from 1 to 1.25 inch
- ii) Install the water injection well and shallow air injection well in separate sandpacked intervals
- iii) Install a steel plate on the bottom of the air injection wells to prevent settling of the wells
- iv) Install a spacer in the upper 0 to 20 feet of the injection well nests to maintain separation between the wells at the ground surface
- v) The HMI and controls have been upgraded so that should a shutdown be required of a select set of injection wells, the remainder of the system will remain operational
- vi) The ability to monitor and operate the system remotely has been enhanced
- vii) Water injections are not performed while air is being injected to prevent the air injection from entering and blocking the water line

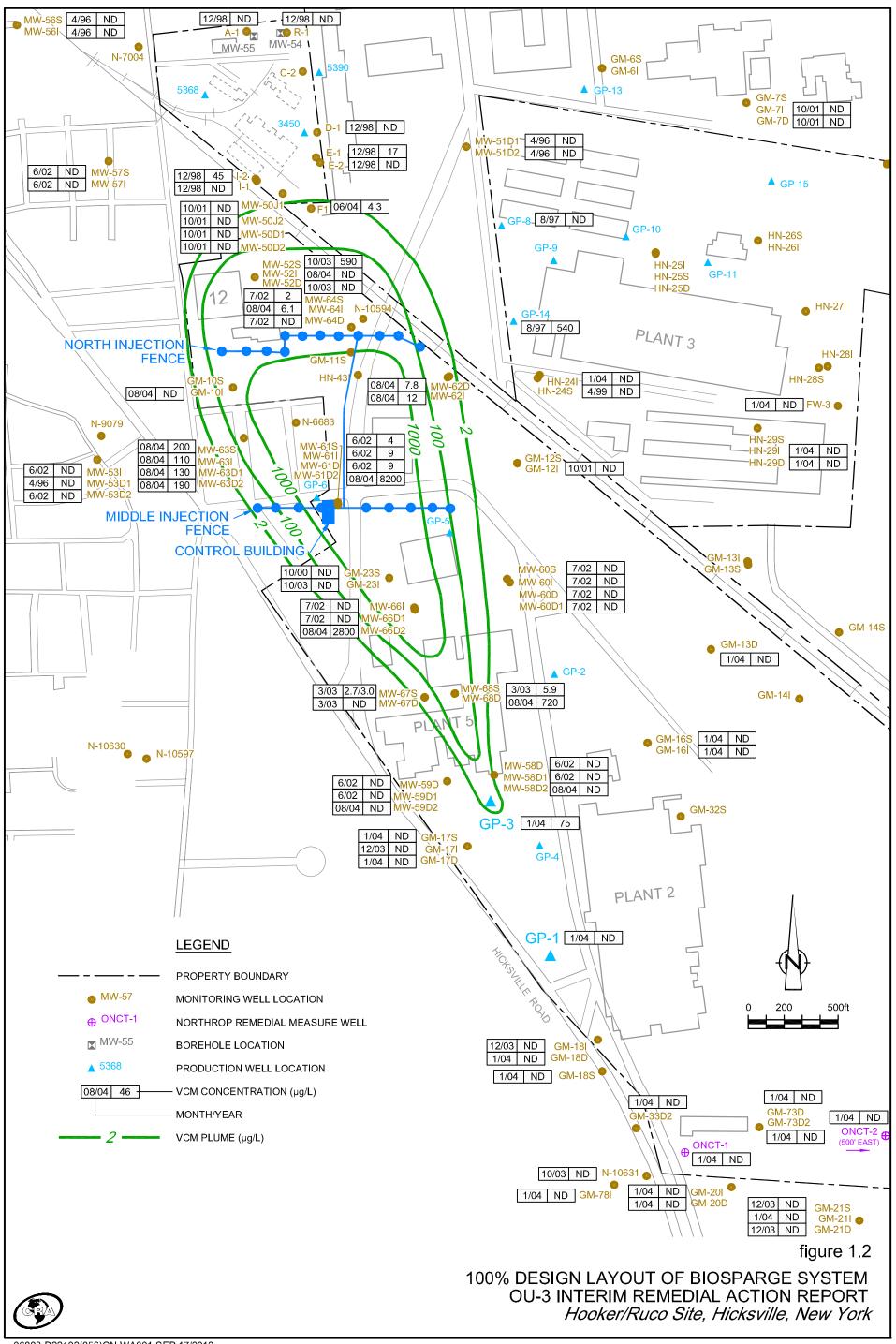
In addition, the purchase and installation of the auxiliary compressor was based on lessons learned during operation of the Pilot System.

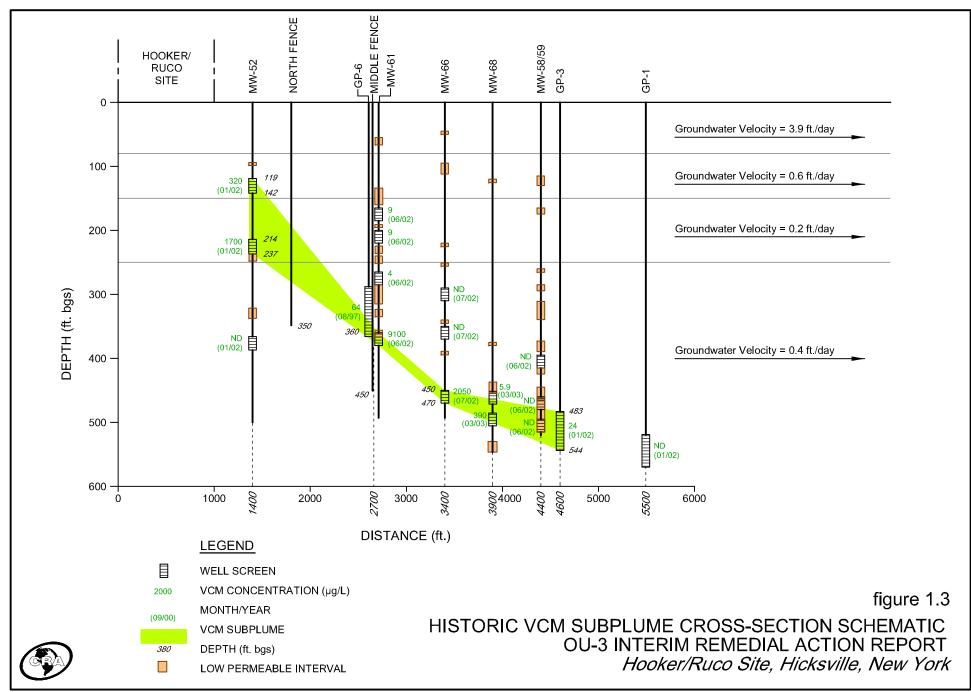
9.0 <u>CONTACT INFORMATION</u>

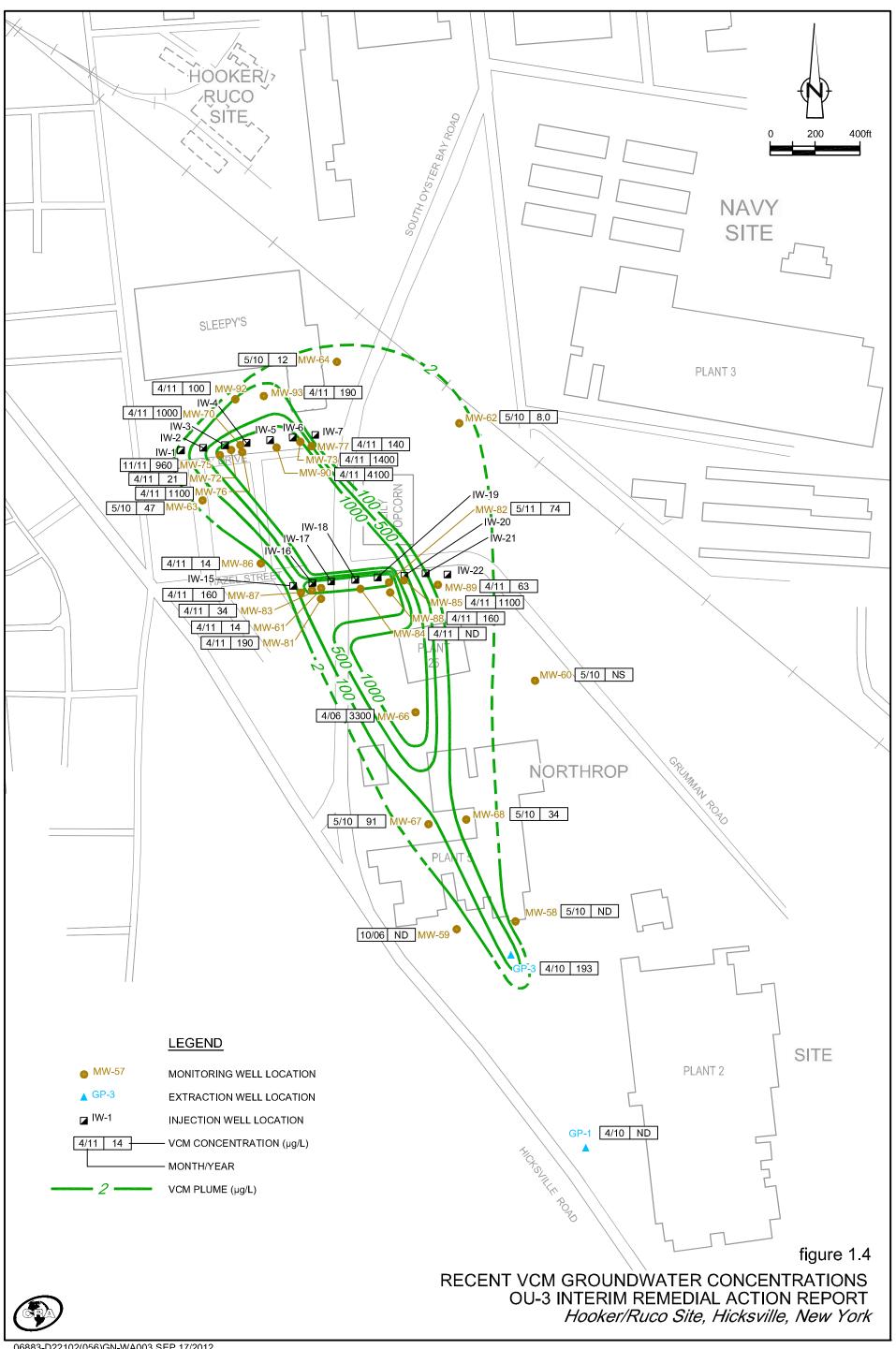
Glenn Springs Holdings, Inc.	
Mr. Roger Smith - Sr. Project Manager	972-687-7516 (office)
	817-975-8705 (cell)
Mr. Barry Hanlon - HES Director	972-687-7508 (office)
	859-619-7212 (cell)
Mr. Mike Anderson - President	972-687-7501 (office)
	859-396-3767 (cell)
	214-484-8803 (home)
CRA	
Process Manager - Julian Worrall	716-297-6150 (office)
	716-773-6111 (home)
Systems Operator - Tom Pestka	716-297-6150 (office)
	•
Project Manager - Jim Kay	519-884-0510 (office)
	519-699-5907 (home)
Technical Advisor - Kevin Lynch	Cell: 716-471-3892
Property Owners	
Bayer Corporation (Mr. Ramon Simon)	281-383-6149
	832-205-3149 (cell)
Northrop (Mr. Edward Hannon)	516-575-2333
	516-353-4618 (cell)
	516-575-3333 (24-hr emergency)
Steel Equities (Kevin Lumpe)	516-576-3165
Sleepy's Mattress (Vir Yabut)	516-861-8800
Agency Contacts	
	El E) 012 (07 4001
United States Environmental Protection Agency (Mr.	Inomas Taccone)212-63/-4281
New York State Department of Environmental Conservation (Stephen Scharf)	518-402-9620
	310 102 7020
Alarm Firm	
Electronix Systems Central Station Alarms, Inc	Office 631-271-4000
	Central Station 631-271-9075

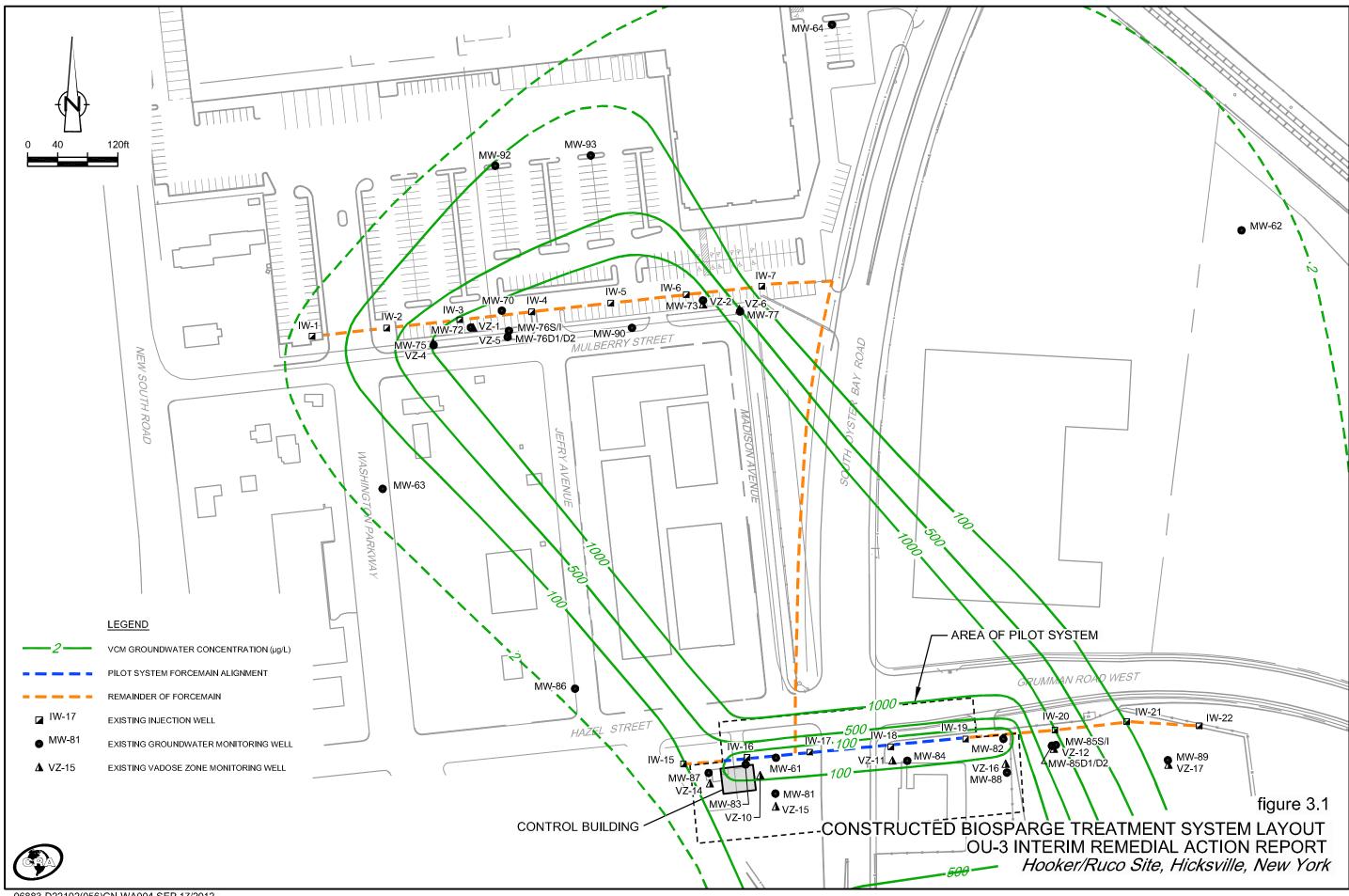
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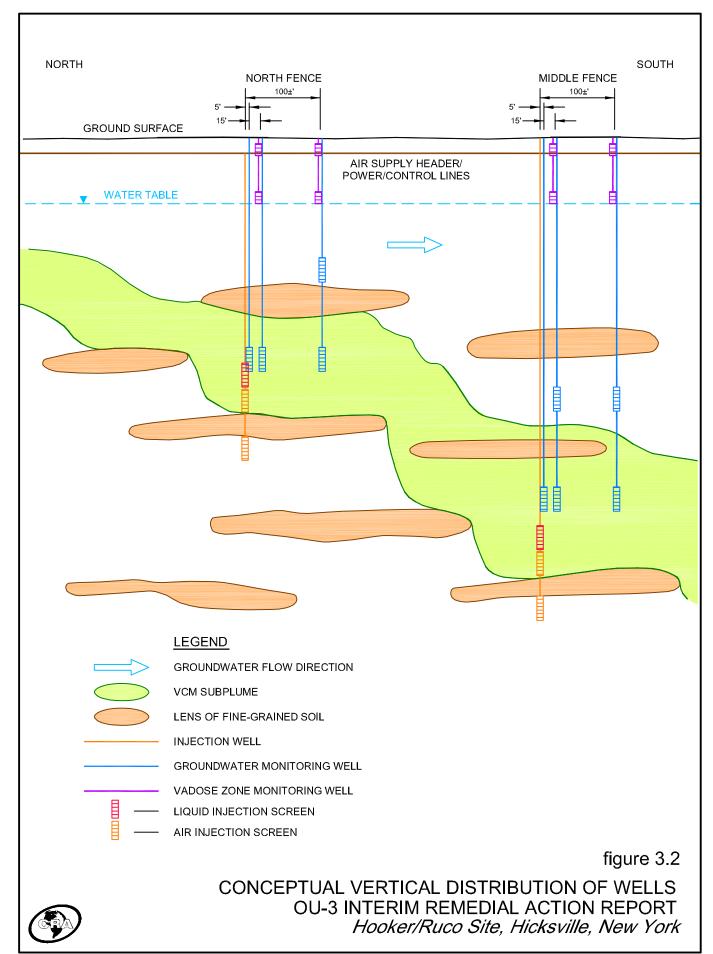


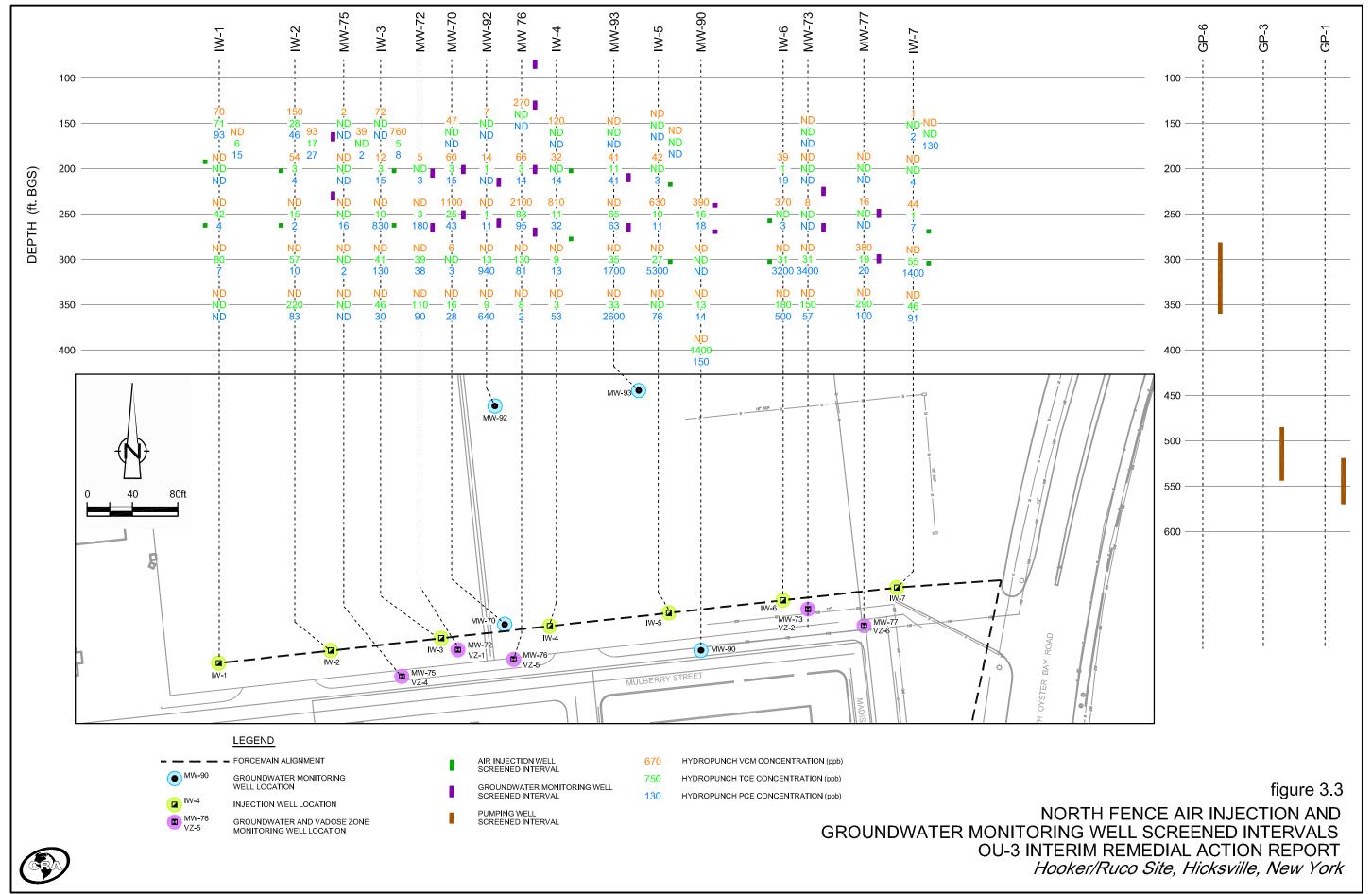


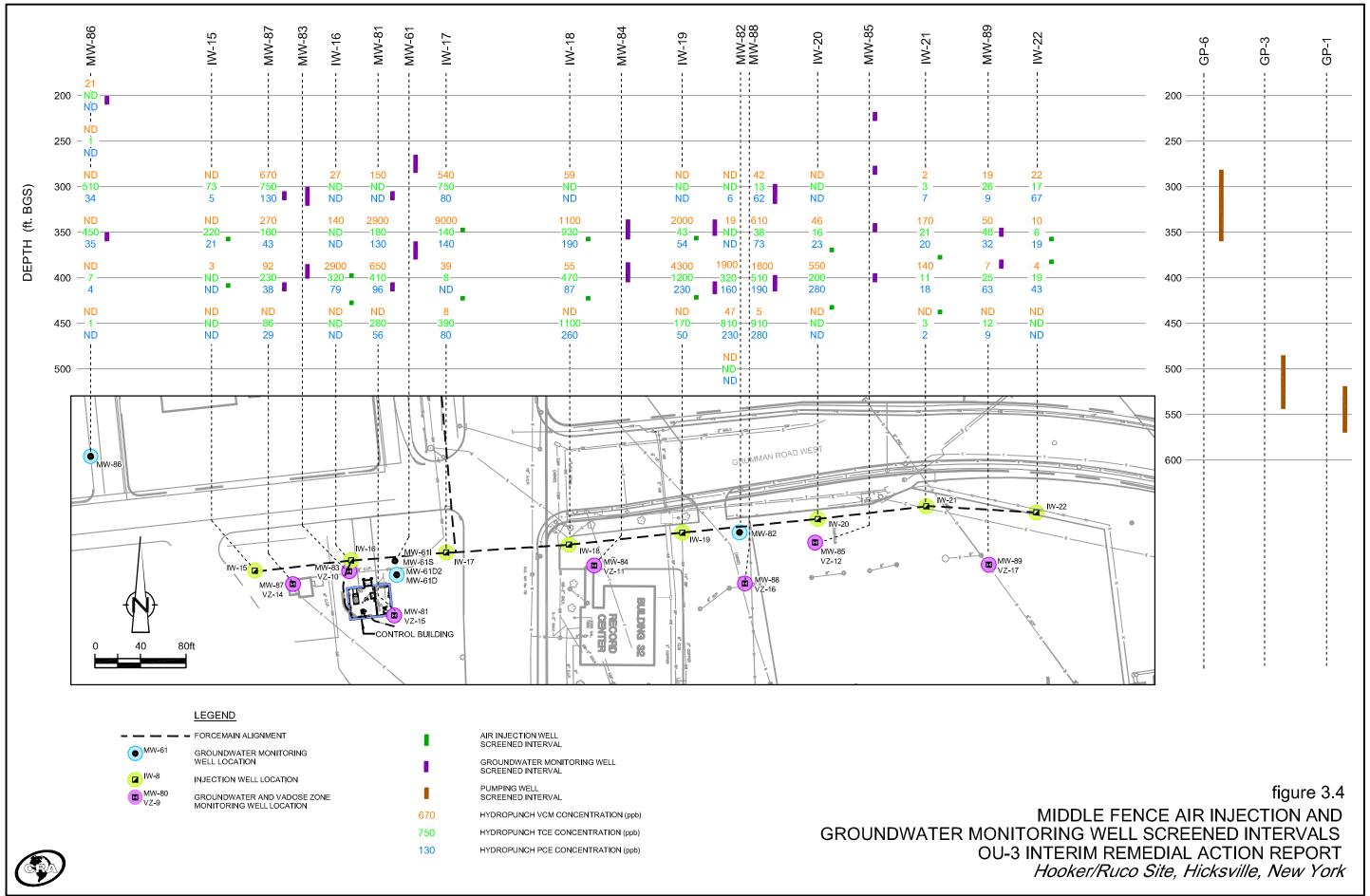


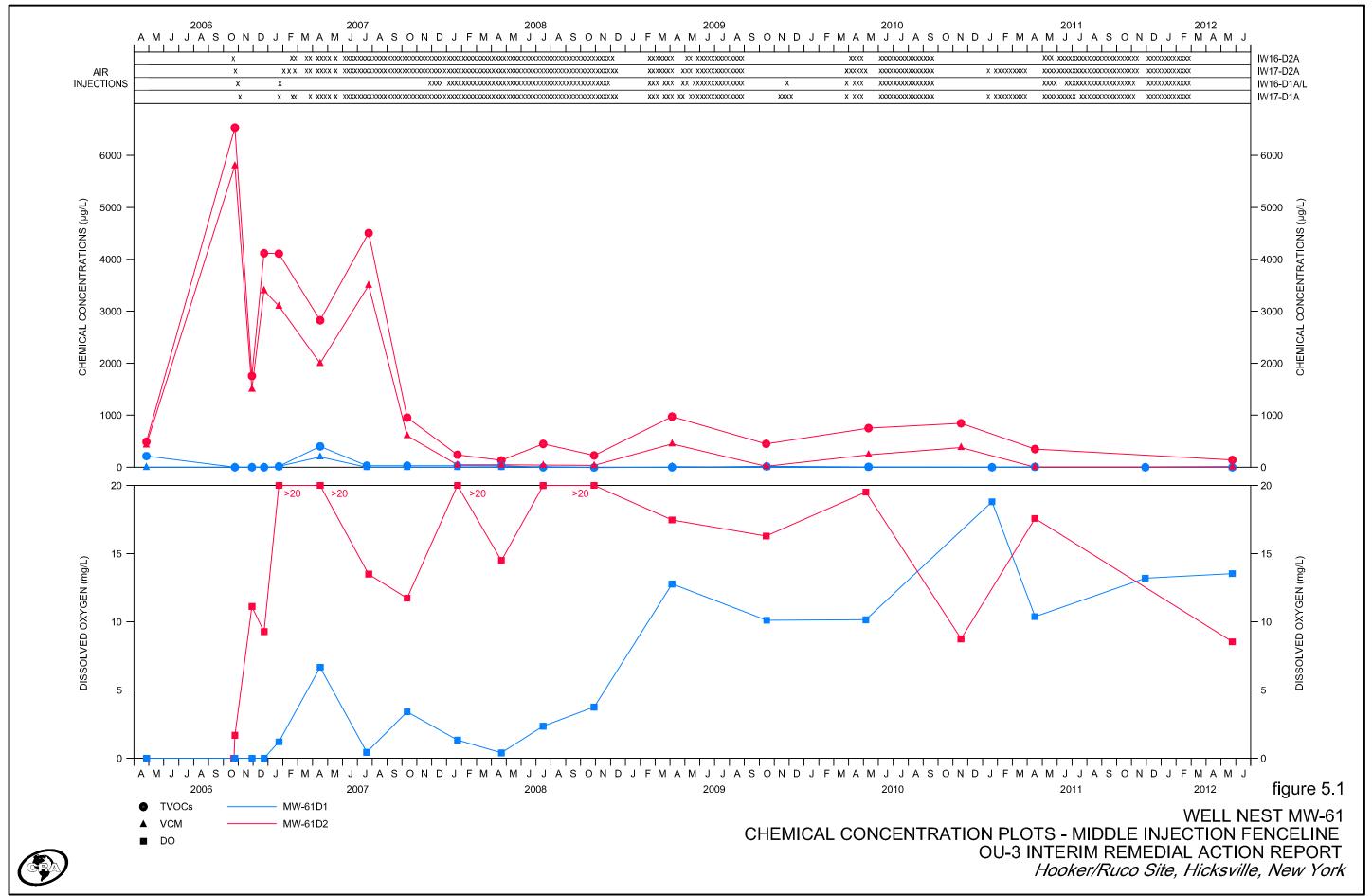


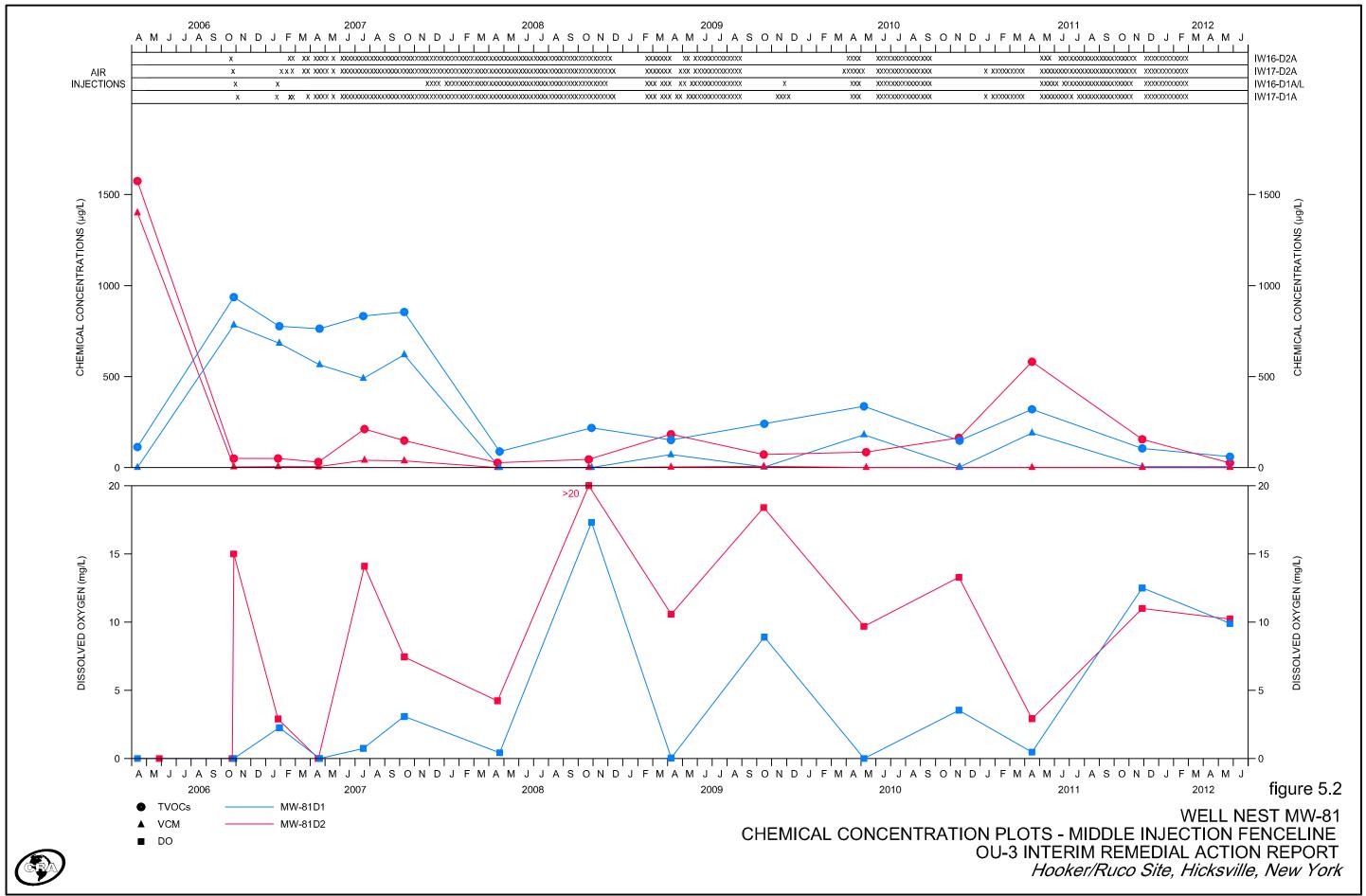


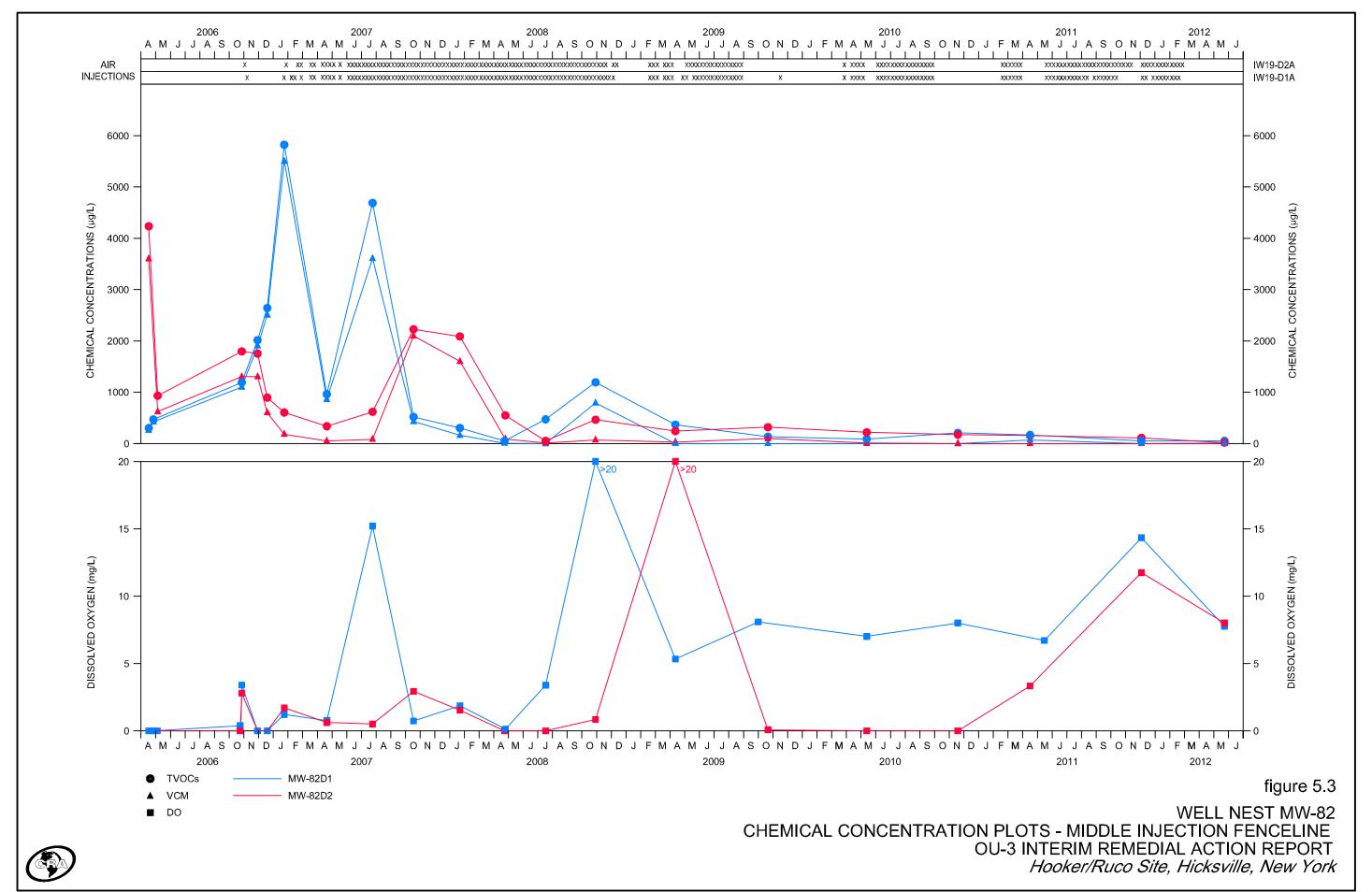


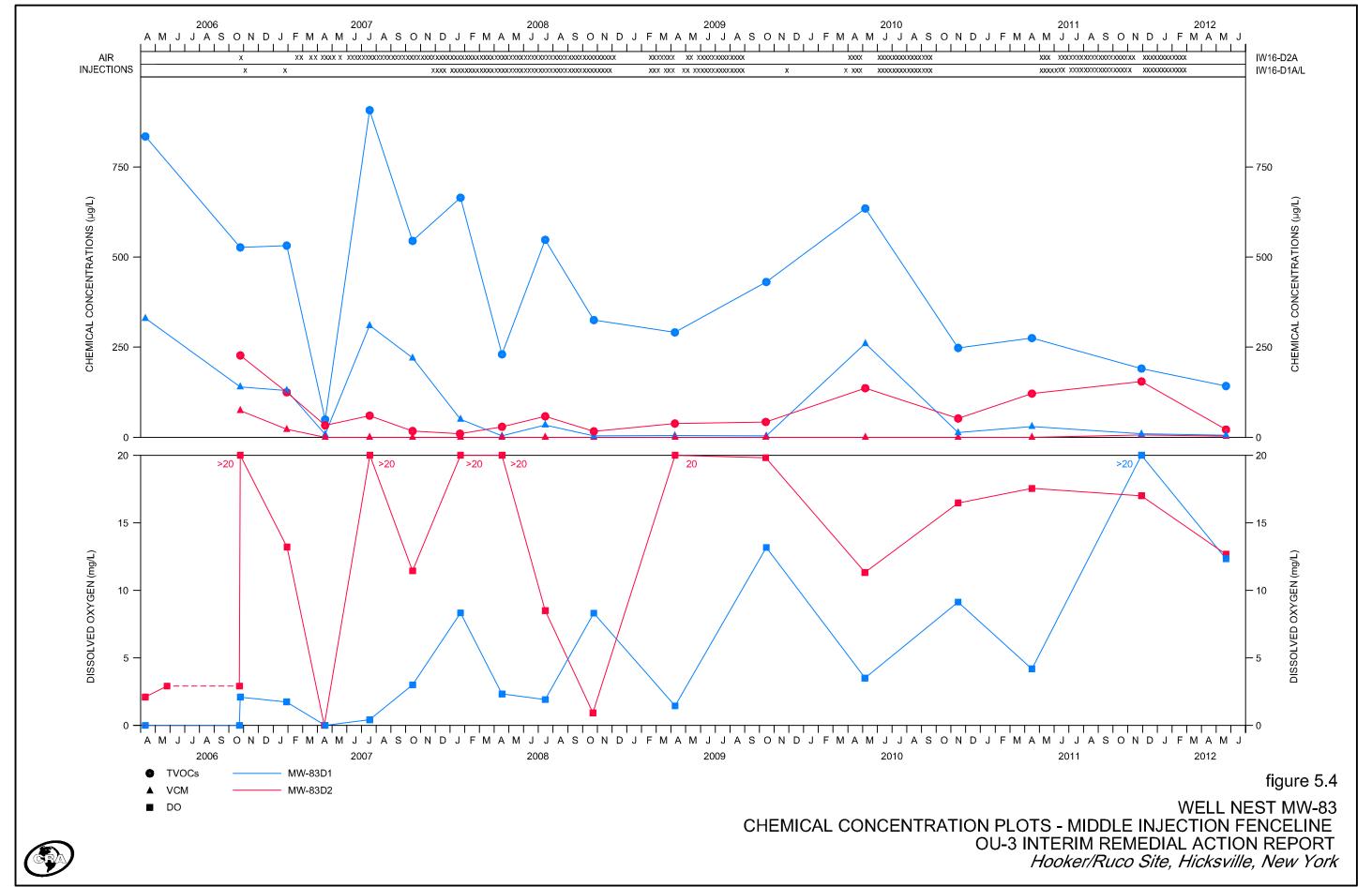


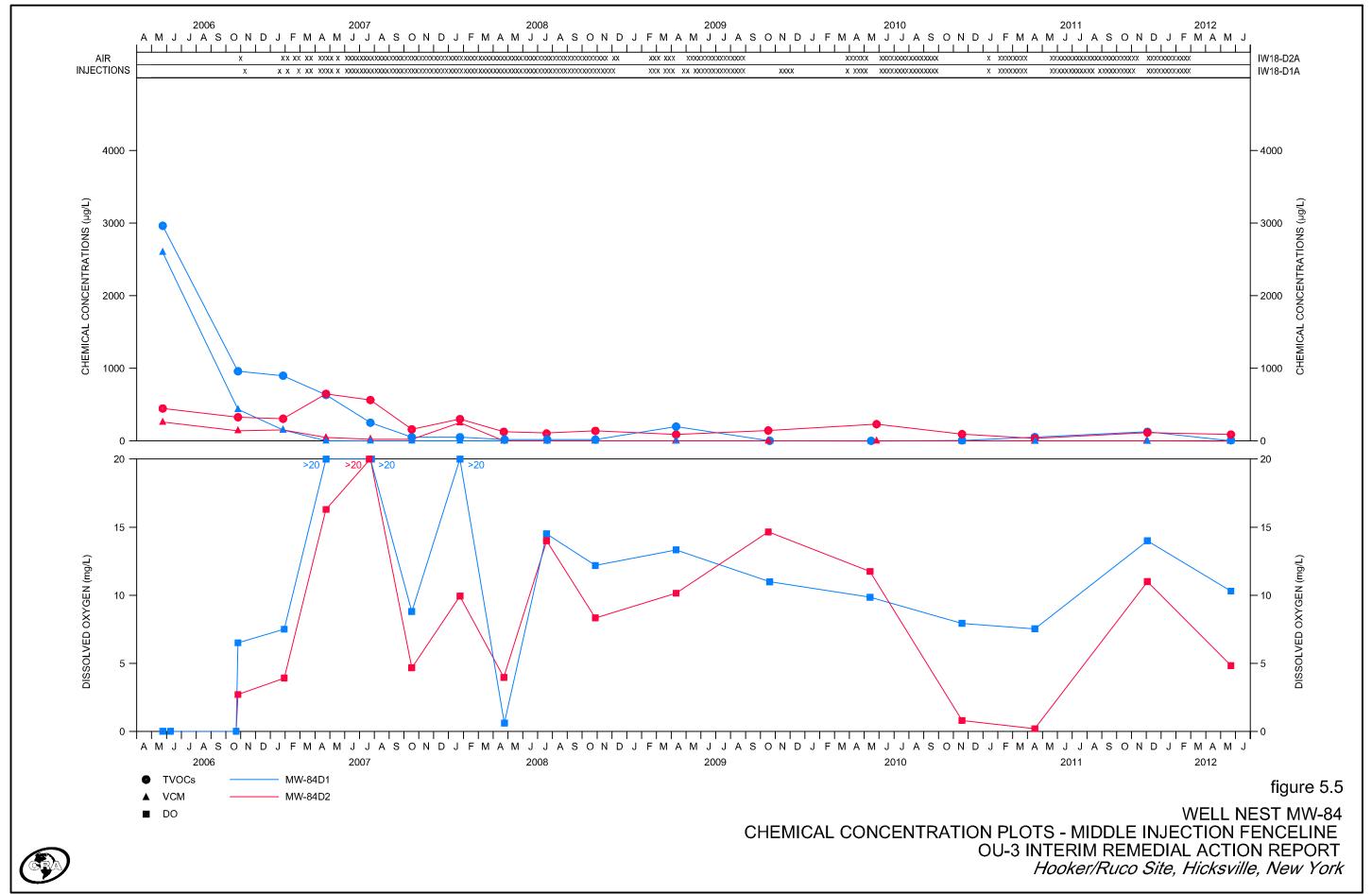


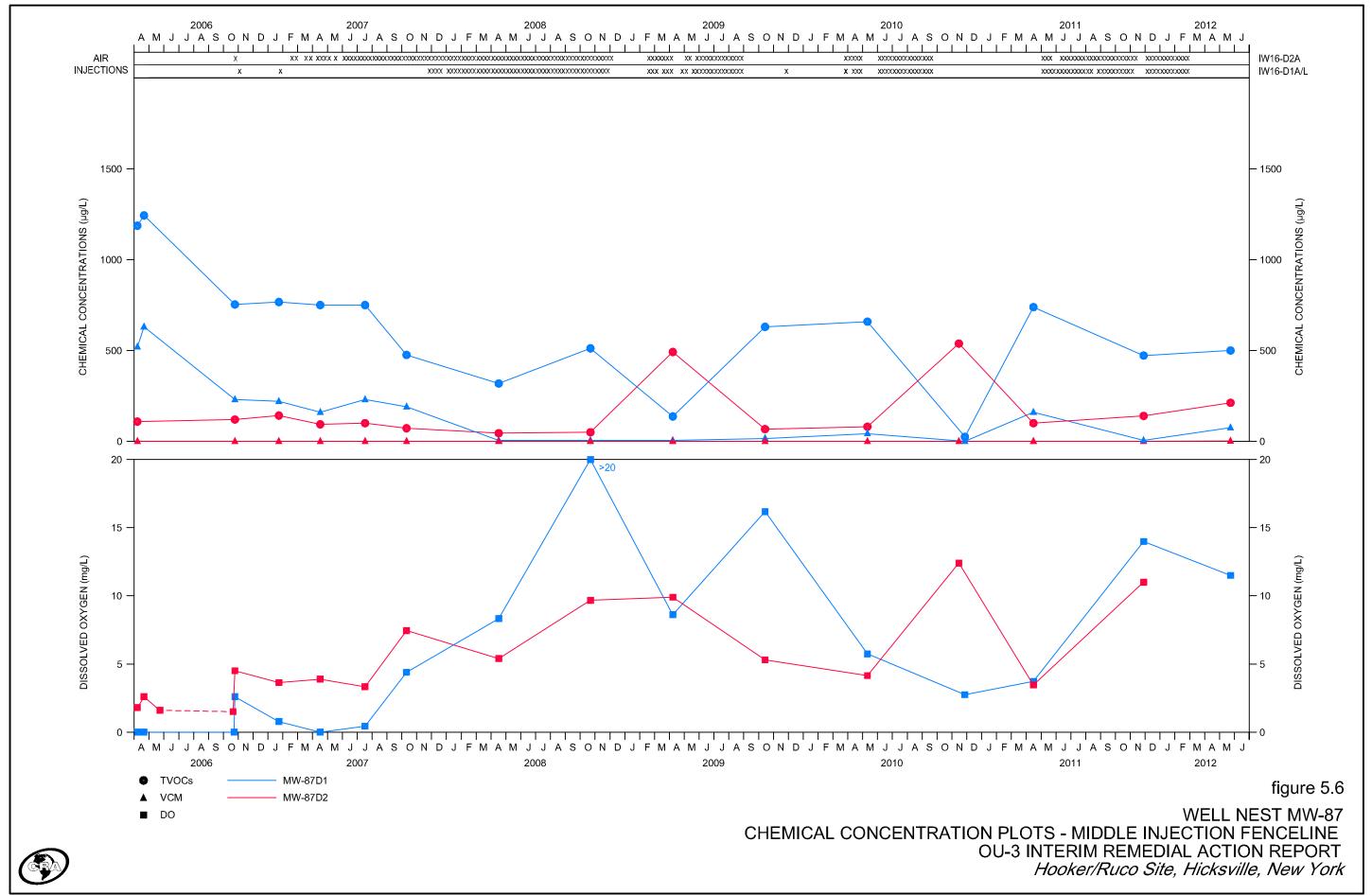












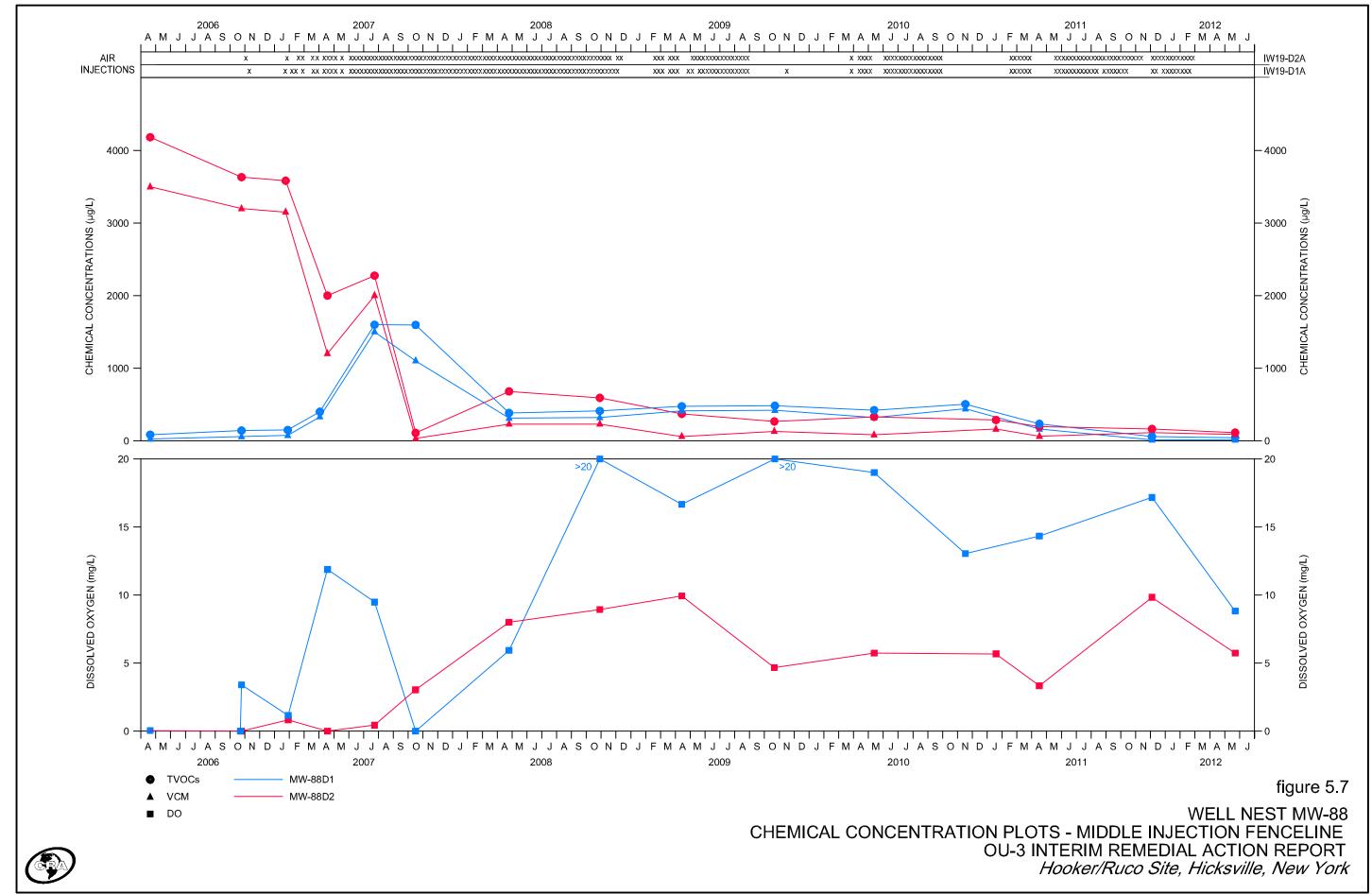


TABLE 2.1

	Sample Location: Sample ID: Sample Date:	MW-58D GW51710VW020 5/17/2010	MW-58D1 GW51910MY021 5/19/2010	MW-61D1 GW51010VW010 5/10/2010	MW-61D2 GW51010VW013 5/10/2010	MW-61I GW51010VW011 5/10/2010	MW-61S GW51010VW012 5/10/2010
Parameters	Units						
Volatile Organic Compounds							
1,1,1-Trichloroethane	μg/L	2.8 J	2.8 J	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	1.9 J	5.0 U	5.0 U
1,1-Dichloroethene	μg/L	9.8	9.2	5.0 U	1.3 J	5.0 U	5.0 U
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	μg/L	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
Benzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	1.3 J	1.2 J	5.0 U	29	5.0 U	5.0 U
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	18	18	6.3	120	6.9	5.4
Toluene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

	Sample Location: Sample ID: Sample Date:	MW-58D GW51710VW020 5/17/2010	MW-58D1 GW51910MY021 5/19/2010	MW-61D1 GW51010VW010 5/10/2010	MW-61D2 GW51010VW013 5/10/2010	MW-611 GW51010VW011 5/10/2010	MW-61S GW51010VW012 5/10/2010
Parameters	Units						
Volatile Organic Compounds (Cont'd.)							
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	47	44	8.0 U	360	7.8 U	8.1 U
Vinyl chloride	μg/L	5.0 U	5.0 U	1.8 J	240	1.6 J	3.5 J
Xylene (total)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
General Chemistry							
Ammonia-N	mg/L	-	-	0.150	0.319	0.150	0.164
Nitrate (as N)	mg/L	-	-	0.815	2.31	0.536	0.840
Nitrite (as N)	mg/L	-	-	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Nitrite/Nitrate	mg/L	-	-	-	-	-	-
Phosphorus	mg/L	-	-	0.15	0.059	0.036	0.17
Total organic carbon (TOC)	mg/L	-	-	10 U	10 U	10 U	10 U

- J Estimated concentration.
- U Not present at or above the associated value.
- UJ Estimated reporting limit.
- Not analyzed.

TABLE 2.1

	Sample Location: Sample ID: Sample Date:	MW-62D GW52510VW033 5/25/2010	MW-62S GW52510VW034 5/25/2010	MW-63D1 GW52410VW029 5/24/2010	MW-63D2 GW52410VW030 5/24/2010	MW-63I GW52110VW028 5/21/2010	MW-63S GW52110VW027 5/21/2010
Parameters	Units						
Volatile Organic Compounds							
1,1,1-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	2.5 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	μg/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	μg/L	1.1 J	5.0 U	3.2 J	3.4 J	3.7 J	2.1 J
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	30	2.4 J	9.6	11	11	8.6
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	2.4 J	5.1 J	6.4 J	6.4 J	5.4 J	2.4 J
Toluene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

	Sample Location: Sample ID: Sample Date:	MW-62D GW52510VW033 5/25/2010	MW-62S GW52510VW034 5/25/2010	MW-63D1 GW52410VW029 5/24/2010	MW-63D2 GW52410VW030 5/24/2010	MW-63I GW52110VW028 5/21/2010	MW-63S GW52110VW027 5/21/2010
Parameters	Units						
Volatile Organic Compounds (Cont'd.)							
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	8.2	5.0 U	9.2	9.1	8.3	4.3 J
Vinyl chloride	μg/L	8.0	4.2 J	35	46	47	16
Xylene (total)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
General Chemistry							
Ammonia-N	mg/L	-	-	-	-	-	-
Nitrate (as N)	mg/L	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	-
Nitrite/Nitrate	mg/L	-	-	-	-	-	-
Phosphorus	mg/L	-	-	-	-	-	-
Total organic carbon (TOC)	mg/L	-	-	-	-	-	-

- J Estimated concentration.
- U Not present at or above the associated value.
- UJ Estimated reporting limit.
- Not analyzed.

TABLE 2.1

	Sample Location: Sample ID: Sample Date:	MW-64D2 GW52410VW033 5/24/2010	MW-64I GW52410VW032 5/24/2010	MW-64S GW52410VW031 5/24/2010	MW-67D GW52010VW023 5/20/2010	MW-67D GW52010VW024 5/20/2010	MW-67S GW52010VW025 5/20/2010
Parameters	Units						
Volatile Organic Compounds							
1,1,1-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	2.0 J	2.2 J	1.1 J	1.4 J	1.4 J	5.0 U
1,1-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	1.6 J	1.2 J	5.0 U
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.6
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	μg/L	5.0 U	7.4	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.0 J
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.9
Chloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.4 J
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	1.5 J	1.2 J	5.0 U	24	24	38
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	5.0 UJ	5.0 UJ	1.5 J	74	73	26
Toluene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.9 J
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

	Sample Location: Sample ID: Sample Date:	MW-64D2 GW52410VW033 5/24/2010	MW-64I GW52410VW032 5/24/2010	MW-64S GW52410VW031 5/24/2010	MW-67D GW52010VW023 5/20/2010	MW-67D GW52010VW024 5/20/2010	MW-67S GW52010VW025 5/20/2010
Parameters	Units						
Volatile Organic Compounds (Cont'd.)							
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	5.0 U	5.0 U	5.0 U	280	280 J	37
Vinyl chloride	μg/L	11	12	2.1 J	5.0 U	5.0 U	87
Xylene (total)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
General Chemistry							
Ammonia-N	mg/L	-	-	-	-	-	-
Nitrate (as N)	mg/L	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	-
Nitrite/Nitrate	mg/L	-	-	-	-	-	-
Phosphorus	mg/L	-	-	-	-	-	-
Total organic carbon (TOC)	mg/L	-	-	-	-	-	-

- J Estimated concentration.
- U Not present at or above the associated value.
- UJ Estimated reporting limit.
- Not analyzed.

TABLE 2.1

	Sample Location: Sample ID: Sample Date:	MW-67S GW52010VW026 5/20/2010 (Duplicate)	MW-68D GW51910MY022 5/19/2010	MW-81D1 GW5610VW008 5/6/2010	MW-81D2 GW51010VW009 5/10/2010	MW-82D1 GW51210VW016 5/12/2010	MW-82D2 GW51210VW017 5/12/2010	MW-83D1 GW5510VW005 5/5/2010
Parameters	Units							
Volatile Organic Compounds								
1,1,1-Trichloroethane	μg/L	5.0 U	2.4 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	5.0 U	2.4 J	5.0 U	1.0 J	3.2 J	2.0 J	5.0 U
1,1-Dichloroethene	μg/L	5.0 U	2.0 J	5.0 U	1.2 J	5.0 U	1.1 J	1.8 J
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	120	5.0 U	5.0 U
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	μg/L	16	5.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U
Benzene	μg/L	2.0 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	6.2	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	μg/L	4.4 J	5.0 U	23	5.0 U	5.0 U	5.0 U	3.7 J
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	37	5.9	13	5.0	3.9 J	11	33
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	27	320	16	14	16	100	96
Toluene	μg/L	2.9 J	5.0 U	5.4	5.0 U	5.0 U	4.0 J	5.0 U
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

Danamatana	Sample Location: Sample ID: Sample Date:	MW-67S GW52010VW026 5/20/2010 (Duplicate)	MW-68D GW51910MY022 5/19/2010	MW-81D1 GW5610VW008 5/6/2010	MW-81D2 GW51010VW009 5/10/2010	MW-82D1 GW51210VW016 5/12/2010	MW-82D2 GW51210VW017 5/12/2010	MW-83D1 GW5510VW005 5/5/2010
Parameters	Units							
Volatile Organic Compounds (Cont'd.)								
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	39	970	99	63	64	92	240
Vinyl chloride	μg/L	95	34	180	5.0 U	5.0 U	7.1	260
Xylene (total)	μg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
General Chemistry								
Ammonia-N	mg/L	-	-	0.744	0.486	0.100 U	1.02	0.200 U
Nitrate (as N)	mg/L	-	-	-	3.03	0.0100 U	1.96	-
Nitrite (as N)	mg/L	-	-	-	0.00819 J	0.0100 U	0.208	-
Nitrite/Nitrate	mg/L	-	-	0.192	-	-	-	1.99
Phosphorus	mg/L	-	-	0.17	0.038	0.033	0.071	0.047
Total organic carbon (TOC)	mg/L	-	-	10 U	10 U	10 U	10 U	10 U

- J Estimated concentration.
- U Not present at or above the associated value.
- UJ Estimated reporting limit.
- Not analyzed.

TABLE 2.1

	Sample Location: Sample ID: Sample Date:	MW-83D2 GW5610VW007 5/6/2010	MW-84D1 GW51210VW018 5/12/2010	MW-84D2 GW52510VW036 5/25/2010	MW-87D1 GW5410VW001 5/4/2010	MW-87D1 GW5410VW002 5/4/2010	MW-87D1 GW5410VW003 5/4/2010 (Duplicate)	MW-87D2 GW5510VW004 5/5/2010
Parameters	Units							
Volatile Organic Compounds								
1,1,1-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	1.9 J
1,1-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	-	2.0 J	2.0 J	1.9 J
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Acetone	μg/L	5.0 U	5.0 U	4.8 J	-	5.0 U	5.0 U	5.0 U
Benzene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Chloroethane	μg/L	5.0 U	5.0 U	5.0 U	-	3.7 J	3.5 J	5.0 U
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U	-	1.0 J	1.3 J	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	8.4	5.0 U	8.3	-	94	96	4.0 J
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	18	1.4 J	23 J	-	170	170	18
Toluene	μg/L	5.0 U	5.0 U	2.6 J	-	5.0 U	5.0 U	5.0 U
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

Parameters	Sample Location: Sample ID: Sample Date: Units	MW-83D2 GW5610VW007 5/6/2010	MW-84D1 GW51210VW018 5/12/2010	MW-84D2 GW52510VW036 5/25/2010	MW-87D1 GW5410VW001 5/4/2010	MW-87D1 GW5410VW002 5/4/2010	MW-87D1 GW5410VW003 5/4/2010 (Duplicate)	MW-87D2 GW5510VW004 5/5/2010
Volatile Organic Compounds (Cont'd.)								
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	110	5.0 U	190	-	360	330	55
Vinyl chloride	μg/L	5.0 U	5.0 U	1.6 J	-	41	44	5.0 U
Xylene (total)	μg/L	5.0 U	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U
General Chemistry								
Ammonia-N	mg/L	0.100 U	0.100 U	1.14	1.18	1.06	1.11	0.200 U
Nitrate (as N)	mg/L	-	3.26	1.81 J	-	-	-	-
Nitrite (as N)	mg/L	-	0.0100 U	0.00677 J	-	-	-	-
Nitrite/Nitrate	mg/L	4.99	-	-	3.36	3.28	3.08	4.65
Phosphorus	mg/L	0.13	0.053	0.030 U	-	0.14	0.14	0.16
Total organic carbon (TOC)	mg/L	10 U	10 U	10 U	-	10 U	10 U	10 U

Notes:

J - Estimated concentration.

U - Not present at or above the associated value.

UJ - Estimated reporting limit.

- Not analyzed.

	Sample Location: Sample ID: Sample Date:	MW-88D1 GW51110VW015 5/11/2010	MW-88D2 GW51110VW014 5/11/2010	MW-90D2 GW51710VW019 5/17/2010
Parameters	Units			
Volatile Organic Compounds				
1,1,1-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	μg/L	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	μg/L	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	μg/L	5.0 U	1.6 J	1.3 J
1,1-Dichloroethene	μg/L	5.0 UJ	5.0 U	5.0 U
1,2-Dichloroethane	μg/L	5.0 U	5.0 U	5.0 U
1,2-Dichloropropane	μg/L	5.0 U	5.0 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	μg/L	6.7	5.0 U	5.0 U
2-Hexanone	μg/L	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	μg/L	5.0 U	5.0 U	5.0 U
Acetone	μg/L	5.0 U	5.0 U	5.0 U
Benzene	μg/L	5.0 U	5.0 U	5.0 U
Bromodichloromethane	μg/L	5.0 U	5.0 U	5.0 U
Bromoform	μg/L	5.0 U	5.0 U	5.0 U
Bromomethane (Methyl bromide)	μg/L	5.0 U	5.0 U	5.0 U
Carbon disulfide	μg/L	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	μg/L	5.0 U	5.0 U	5.0 U
Chlorobenzene	μg/L	1.7 J	5.0 U	5.0 U
Chloroethane	μg/L	12	5.0 U	5.0 U
Chloroform (Trichloromethane)	μg/L	5.0 U	5.0 U	5.0 U
Chloromethane (Methyl chloride)	μg/L	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	μg/L	19	26	6.8
cis-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U
Dibromochloromethane	μg/L	5.0 U	5.0 U	5.0 U
Ethylbenzene	μg/L	5.0 U	5.0 U	5.0 U
Methylene chloride	μg/L	5.0 U	5.0 U	5.0 U
Styrene	μg/L	5.0 U	5.0 U	5.0 U
Tetrachloroethene	μg/L	28	130	26
Toluene	μg/L	5.0 U	6.1	5.0 U
trans-1,2-Dichloroethene	μg/L	5.0 U	5.0 U	5.0 U

ANALYTICAL RESULTS SUMMARY - GROUNDWATER BIOSPARGE SYSTEM PERFORMANCE SAMPLING GLENN SPRINGS HOLDINGS, INC. HOOKER-RUCO SITE HICKSVILLE, NEW YORK MAY 2010

	Sample Location: Sample ID: Sample Date:	MW-88D1 GW51110VW015 5/11/2010	MW-88D2 GW51110VW014 5/11/2010	MW-90D2 GW51710VW019 5/17/2010
Parameters	Units			
Volatile Organic Compounds (Cont'd.)				
trans-1,3-Dichloropropene	μg/L	5.0 U	5.0 U	5.0 U
Trichloroethene	μg/L	32	85	68
Vinyl chloride	μg/L	320	81	2.1 J
Xylene (total)	μg/L	1.5 J	5.0 U	5.0 U
General Chemistry				
Ammonia-N	mg/L	0.100 U	0.248	-
Nitrate (as N)	mg/L	0.0100 U	1.11	-
Nitrite (as N)	mg/L	0.00778 J	0.0324	-
Nitrite/Nitrate	mg/L	-	-	-
Phosphorus	mg/L	0.073	0.20	-
Total organic carbon (TOC)	mg/L	10 U	10 U	-

- J Estimated concentration.
- U Not present at or above the associated value.
- UJ Estimated reporting limit.
- Not analyzed.

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
September 29, 2000 April 26, 2001	OU-3 ROD finalized by EPA. Administrative Order Index No. II-CERCLA-02-2001-2010 issued.
January 23, 2002	Revised OU-3 SOW submitted to EPA.
February 8, 2002	Revised OU-3 SOW approved by EPA.
February to November 22, 2002	Performed predesign activities. Off-Site Groundwater Predesign Information Report (PDIR) submitted to EPA.
April to September 1, 2002	Construct Supplemental Treatment System. for Northrop GP-1/GP-3 Treatment System
August 16, 2002	O&M Plan for Supplemental Treatment System provided to Northrop.
March 6, 2003	EPA comments received on the Off-Site Groundwater Pre-design Information report
March 27, 2003	Responses submitted to EPA PDIR comments.
June 25, 2003	Additional EPA comments received on PDIR.
July 9, 2003	Supplemental Treatment System starts full-time operation.
July 29, 2003	Responses submitted to additional EPA PDIR comments EPA considers the PDIR to be the 30% Design Report.
September, 2003	Lag bed of Supplemental Treatment System converted from granular activated carbon to potassium permanganate to handle VCM more efficiently.
October 31, 2003	Pre-Final (95%) Remedial Design Report submitted to EPA.
April 12, 2004	EPA comments received on the 95% Design Report.
May 27, 2004	Responses submitted to EPA comments on the 95% Design Report.
November 17, 2004	EPA comments received on May 27 responses.
December 6, 2004	Responses submitted to November 17 EPA comments.
January 5, 2005	EPA approval received for closure of 6 off-Site and 20 on-Site groundwater monitoring wells.
January 12, 2005	EPA comments received on December 6 responses.
February 1, 2005	Responses submitted to January 12 EPA comments.
March 14, 2005	Redlined Final 100% submitted to EPA.
May 2005	Request for Bid for Pilot System well installation distributed May 19. Request for Bid for remaining components of Pilot System distributed May 20. 100% Final Design Report submitted May 27.
June 2005	Bids for Pilot System well installation received June 8. Bids for remaining components of Pilot System received June 10.

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
July 2005	EPA approval received July 7 of 100% Final Design Report. Contract for remaining components of Pilot System awarded to a.d. Winston July 11. Contract for Pilot System well installation awarded to Prosonic July 22.
August 2005	Prosonic started to mobilize to the Site August 30.
September 2005	Pre-Construction meeting held on September 6 to discuss emergency contingency plans/procedures with local providers. Prosonic started borehole drilling and well installation on September 13 for the Pilot System.
November 2005	A.D. Winston mobilized to the Site the week of November 7 and started installation of the Biosparge Pilot System Control Building and underground components.
December 2005	Meeting held with EPA on December 8 to provide project update.
January 2006	Approval received January 31 from Nassau County Department of Public Work to discharge well installation and development water to the Cedar Creek WPCP for a period of 1 year.
February 2006	Twenty wells on the Site property were abandoned.
March 2006	Draft Declaration of Covenants and Restrictions for the Site was submitted by Bayer (current property owner) on March 20. Background sampling of the Pilot System groundwater monitoring wells started March 27. Approximately 15,000 gallons of well installation/development water discharged to the Cedar Creek WPCP.
April 2006	Approximately 15,000 gallons of well installation/development water discharged to the Cedar Creek WPCP. Installation of the Pilot System wells completed. Shakedown and startup of the Pilot System commenced.
May 2006	Six off-Site wells abandoned. Development of Pilot System wells completed. Prosonic demobilized May 10, 2006. Approximately 15,000 gallons of well installation/development water discharged to the Cedar Creek WPCP.
June 2006	Excess drill cuttings transported to and disposed of at the BFI Conestoga Landfill located in Morganstown, PA. Background sampling of the groundwater monitoring wells was completed June 14.
July 2006	The eight remaining on-Site wells were abandoned.
August 2006	USEPA provided Northrop letter dated August 4 supporting the use of treated groundwater from Northrop's GP-1/GP-3 treatment system for injection by GSHI. Northrop submitted application to the New York State Public Service Commission August 8 requesting permission to provide up to 20 gpm of treated water Northrop's GP-1/GP-3 treatment system to GSHI.
September 2006	Shakedown and startup of the Pilot System was completed. Pre-Final Inspection held on September 14.

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
October 2006	Pre-Start monitoring for the Pilot System was performed on October 24, 26, and 26. Final Inspection held on October 27 Pilot System becomes fully operational.
November 2006	New York State Public Service Commission approval received November 13 to inject treated water from Northrop's GP-1/GP-3 treatment system. Pilot System shutdown due to observed release of air and groundwater from monitoring well MW-61D2 on November 18. Performance monitoring for the Pilot System was performed on November 28, 29, and 30.
January 2007	Certificate of Occupancy received January 11 from the Town of Oyster Bay Department of Planning and Development. Noise survey of Biosparge Control Building performed on January 18. Biosparge System restarted January 19. Performance monitoring for the Pilot System was performed on January 22 to 30. Injection of treated water from Northrop started on January 22.
February 2007	Pilot System "As-Recorded" Construction Drawings, well stratigraphy and instrumentation logs, Draft O&M Manual and HASP were submitted to EPA on February 1. Notice received February 27 from Steel Equities regarding impending development of former Northrop Plant 12 property. Notice included request to abandon well nest MW-52. Notification regarding this request submitted February 28 to EPA.
March 2007	Well nest MW-52 was sampled March 13 and 14 and abandoned on March 16 and 19. Approval received March 26 from Nassau County Department of Public Works to discharge well purge water to the Cedar Creek WPCP for a period of one year.
April 2007	Performance monitoring for the Pilot System was performed from April 18 to 27.
May 2007	Steel Equities provided on May 12 the updated redevelopment plan for the former Northrop Plant 12 property.
June 2007	Discussions held during June 18 conference call with the EPA, NYSDEC, MSRMI (nka GSHI) and CRA. It was agreed that TICs had been adequately addressed. TICs will no longer be analyzed for.
July 2007	Air injection well IW16-D1A was redeveloped on July 23. Performance monitoring for the Pilot System was performed from July 16 to 27.
September 2007	Specifications and Drawings for the north fence were provided to Steel Equities on September 7. Quotes for the north fence underground components were requested.
October 2007	Performance monitoring for the Pilot System was performed from October 8 to 18.
January 2008	Recommended modifications to the Biosparge System design and operations were provided in Fourth Quarter 2007 progress report dated January 15. Performance monitoring for the Pilot System was performed from January 27 to 28.
March 2008	Update of Biosparge System provided at March 19 Technical Advisory Committee (TAC) meeting. Approval received March 21 from Nassau County Department of Public Works for discharge of well development and purge water to the Cedar Creek WPCP for a period of 1 year.
April 2008	Performance monitoring for the Pilot System was performed from April 16 to 25. Bids for Plant 12 underground components received.

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
July 2008	The Marcus Organization was selected on July 28 as contractor for the underground components of north fence. Performance monitoring for the Pilot System was performed from July 15 to 18.
September 2008	Installation of the underground components of the Biosparge System north fence located on Steel Equities/Sleepy's property started September 29.
October 2008	Performance monitoring for the Pilot System was performed from October 20 to 31.
December 2008	Pilot System shutdown due to observed release of air and groundwater from MW-61D2 on December 8. Installation of the underground components of the Biosparge System north fence on Steel Equities/Sleepy's property was completed the week of December 22.
January 2009	Pilot System groundwater monitoring well vaults modified and replaced.
February 2009	Pilot System restarted February 17.
March 2009	Approval received March 16 from Nassau County Department of Public Works for discharge of purge water to Cedar Creek WPCP for a 1 year period.
June 2009	"As-Built" drawings for the north fence components received from The Marcus Organization on June 3.
August 2009	The SCADA PC software and network were upgraded. The PLC processor was replaced due to this upgrade. Biosparge System air compressor failed on August 24. EPA comments on the Biosparge System progress reports, the draft O&M Manual and the HASP were received on August 27.
September 2009	Responses to the EPA comments were submitted on September 23.
October 2009	Performance monitoring of the Pilot System was performed from October 13 to 21.
November 2009	A meeting was held November 4 among the EPA, GSHI, and CRA. During the meeting EPA agreed that the Biosparge System was working as designed. The Biosparge System air compressor was believed to be repaired on November 9. Injection into the shallow injection wells attempted on November 9. Attempts were unsuccessful. Additional evaluations of air compressor performed. Information supporting the effectiveness of the Biosparge System was submitted on November 30.
January 2010	EPA letter received on January 25 in response to November 30 submission. Letter agreed that biodegradation of VCM was occurring and requested north and remainder of middle fence construction be started in 2010.
February 2010	An updated schedule was submitted to EPA on February 3. EPA approval of the updated schedule was received on February 23.
March 2010	Approval received March 11 from Nassau County Department of Public Works for discharge of well installation, development, and purge water to the Cedar Creek WPCP for a 3-year period. Repair of the Biosparge System air compressor was completed on March 25 and full operation resumed on March 29. USEPA requested on March 30 a work plan, including a QAPP, for a controlled study to evaluate the use of PDB/HydraSleeve TM samplers.
April 2010	A back-up compressor was purchased and installed as a contingency should shutdown of the main compressor occur.

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
May 2010	Performance monitoring of the Pilot System and of the VCM sub-plume was performed from May 3 to 25.
June 2010	Electronic and hard copy of base map submitted to EPA on June 23. Request for Bid for biosparge system wells distributed June 25. Access request for wells on Blackman Plumbing property submitted June 25.
July 2010	A workplan and QAPP Addendum for the evaluation of LFP vs. PDB samples were submitted on July 9. Bids for well installation were received July 12.
August 2010	Contract for well installation awarded to Boart Longyear on August 3. Application to relocate well to be located on Blackman Plumbing property to Town of Oyster Bay property submitted August 4.
September 2010	Boart Longyear mobilized to the Site on September 20 for the borehole drilling and well installation for the remainder of the Biosparge System. Injunction received September 30 restraining drilling activities in the vicinity of Blackman Plumbing properties. Biosparge system air pompressor shut-down the 4th week of September for installation of wells for remainder of biosparge system.
October 2010	Request for Bids for the remaining components of the Biosparging Systems were distributed on October 14. Meeting held October 21 with Blackman Plumbing representatives to discuss possible well locations in the vicinity of Blackman Plumbing properties on Town of Oyster Bay property. Permission received October 22 from Town of Oyster Bay for alternate locations. EPA comments were received October 25 on the work plan/QAPP Addendum. A final QAPP Addendum was submitted on October 26. A request was made to Northrop on October 28 to install an additional well approximately 100 feet east of the IW-22.
November 2010	Bids for remaining components of the Biosparge System were received November 4. Performance monitoring of 12 of the 15 Pilot System groundwater monitoring wells was performed by LFP method from November 15 to 24. Four wells were sampled with PDBs. The PDB samplers were installed on November 15 and retrieved on November 29. Only one PDB sampler could be successfully retrieved.
December 2010	WHM Plumbing awarded on December 6 installation of the remaining components of the Biosparge System subject to satisfactorily complying with GSHI health and safety requirements.
January 2011	Performance monitoring of the remaining three Pilot System wells by LFP method was performed on January 20.
February 2011	All bidders were disqualified on February 18 due to inability to comply with GSHI health and safety requirements.
March 2011	Northrop denied on March 16 access to install an additional well approximately 100 feet east of IW-22. EPA approval of the GROWS Landfill in Morrisville, PA for the disposal of drill cuttings was received on March 17. Modified QAPP Addendum submitted to EPA on March 21. EPA approval of the modified QAPP Addendum received March 21. EPA approval of the Cycle Chem facility in Elizabeth, NJ for use as a transfer facility was received on March 23. Approximately 15,000 gallons of well installation and development water was discharged to the Cedar Creek WPCP on March 7 and 12. One roll-off of drill cuttings was shipped off-Site on March 23. Biosparge system compressor restarted the 4th week of March.

TABLE 3.1

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
April 2011	Performance monitoring of the Pilot System and background sampling of the remainder of the Biosparge System was performed from April 5 to 28. Approximately 15,000 gallons of well installation and development water was discharged to the Cedar Creek WPCP on April 5.
May 2011	Bid documents for the remaining components of the Biosparge System were distributed to three new bidders on May 4 Well installation and development was completed on May 14. Approximately 10,000 gallons of well installation and development water was discharged to the Cedar Creek WPCP on May 14. Boart Longyear have completed the well installations and demobilized from the Site on May 15. Two roll-offs of drill cuttings were shipped off Site on May 20.
June 2011	Two roll-offs of drill cuttings were shipped off Site on June 7. Bids for the remaining Biosparge System components were received on June 17. Update of the Biosparge System provided at June 17 TAC meeting.
August 2011	CRA was given the opportunity to bid on the remaining components of the biosparge system on August 19. Evaluation comparing LFP to PDB/HydraSleeve sample results submitted to EPA August 31.
September 2011	EPA concurrence received September 22 allowing the use of PDB/HydraSleeve samplers for future groundwater sampling events. Updated QAPP requested September 22 by EPA
October 2011	Updated QAPP submitted on October 24. CRA Contractors was awarded on October 28 the contract for the installation of the remaining components of the Biosparge System.
November 2011	Performance monitoring of the Pilot System was performed using PDB/HydraSleeve samplers. Samplers were installed between November 9 and 11 and were retrieved between November 30 and December 1.
December 2011	An updated base map of the Site was submitted to the EPA on December 2. EPA comments were received on December 6 on the updated QAPP.
January 2012	A revised QAPP and responses to comments were submitted to the EPA on January 3. Notifications of the start of construction of the remainder of the biosparge system was submitted to the EPA on January 27.
February 2012	Pre-construction meeting held on February 9.
March 2012	Biosparge system compressors shut down and locked out on March 2 to allow for construction of the remaining components of the biosparging system. Contractor mobilized to the Site on March 5.
April 2012	A revised QAPP was submitted to the EPA on April 13.
May 2012	Performance monitoring of the Pilot System was performed. Samplers were installed on May 9 and retrieved on May 24 and 25.
June 2012	NYSDEC approval received June 19 to place excess soil on the Bayer property
July 2012	Construction of the remaining components of the biosparge system is complete. Startup/shakedown of the system is started Pre-Final Inspection performed on July 27.

TABLE 3.1

CHRONOLOGY OF REMEDIAL ACTION IMPLEMENTATION ACTIVITIES OPERABLE UNIT-3 (OFF-SITE GROUNDWATER) HOOKER/RUCO SITE, HICKSONVILLE, NEW YORK

Date	Description
August 2012	Draft Remedial Action Report submitted to EPA August 9, Civil and Mechanical As-Built Drawings submitted to EPA August 29.
September 2012	Final Inspection performed on September 12. Full time operation started September 17.

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SUMMARY OF VCM, PCE, AND TCE CONCENTRATIONS
HYDROPUNCH/ISOFLOW GROUNDWATER SAMPLES
BIOSPARGE SYSTEM
HICKSVILLE, NEW YORK

A) <u>Upgradient of North Fence</u>																											
Well (West to East) Sample Depth (ft bgs)	152	202	MW-92 252	302	352		152	202	MW-93 252	302	352	-															
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND 6.5	ND 1.1 14	11 1.2 ND	940 13 ND	640 8.6 ND		ND ND ND	41 11 41	63 65 ND	1700 35 ND	2600 33 ND																
B) North Fence Well (West to East) Sample Depth (ft bgs)	152	172		V-1 262	302	352		153	173		V-2 263	303	353		152	172	<i>MW</i> 202	-75 252	302	352		154	172		2-3 252	302	352
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	93 71 70	15 6 ND	ND ND ND	4 42 ND	7 80 ND	ND ND ND		46 28 150	27 17 93	4 3 54	2 15 ND	10 57 ND	83 220 ND		ND ND 2	2 ND 39	ND ND ND	16 ND ND	1 2 ND	ND ND ND		ND ND 72	8 5 760	15 3 12	830 10 ND	130 41 ND	30 46 ND
Well (West to East) Sample Depth (ft bgs)	162	202	MW-70 252	302	352		202	MV 252	V-72 302	352	-	142	202	MW-76 262	302	352	-	162	202	IW-4 252	302	352					
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND 47	15 3 60	43 25 1100	3 ND 6	28 16 ND		3 ND 5	180 3 ND	38 39 ND	90 110 ND		ND ND 270	14 3 66	95 83 2100	81 130 ND	2 8 ND		ND ND 120	14 ND 32	32 11 810	13 9 ND	53 3 ND					
Well (West to East) Sample Depth (ft bgs)	152	172	1W 202	V-5 252	302	352		250	<i>MW-</i> 300	350	400	-	202	1W 252	302	352	-	162	202	MW-73 252	302	352					
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND ND	ND ND ND	3 ND 42	11 10 630	5300 27 ND	76 ND ND		18 16 390	ND ND ND	14 13 ND	150 1400 ND		19 1.4 39	3.3 ND 370	3200 31 ND	500 180 ND		ND ND ND	ND ND ND	ND ND 8	3400 31 ND	57 150 ND					
Well (West to East) Sample Depth (ft bgs)	202	252	N-77 302	352	-	152	172	202	V-7 252	302	352	-															
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND ND	ND ND 16	20 19 380	100 290 ND		2 ND 1	130 ND ND	4 ND ND	7 1 44	1400 55 ND	91 46 ND																
C) Middle Fence Well (West to East) Sample Depth (ft bgs)	200	253	MW 310	V-86 350	400	450		300	IW 350	7-15 400	450	-	300	MW-6	87 ⁽¹⁾ 400	450	-	300	IW- 350	-16 ⁽¹⁾ 400	450	_					
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND 21	ND 1.1 ND	34 510 ND	35 450 ND	4 7 ND	ND 1 ND		5.2 73 ND	21 220 ND	ND ND 3.1	ND ND ND		130 750 670	43 160 270	38 230 92	29 86 ND		ND ND 27	ND ND 140	79 320 2900	ND ND ND						
Well (West to East) Sample Depth (ft bgs)	300	<i>MW-</i> 350	-81 ⁽¹⁾ 400	450	-	300	IW-1	400	450		300	<i>IW-</i> 350	400	450		300	IW-1 350	9 (1)	450	-							
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	ND ND 150	130 180 2900	96 410 650	56 280 ND		80 750 540	140 140 9000	ND 8 39	80 390 8.4		ND ND 59	190 930 1100	87 470 55	260 1100 ND		ND ND ND	54 43 2000	230 1200 4300	50 170 ND								
Well (West to East) Sample Depth (ft bgs)	300	350	MW-82 (1) 400	450	500		300	350	-88 ⁽¹⁾ 400	450	-	300	1W 350	7-20 400	450	_	300	<i>IW-</i> 350	-21 400	450							
Parameter (µg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	5.5 ND ND	ND ND 19	160 320 1900	230 810 47	ND ND ND		62 13 42	73 38 610	190 510 1800	280 910 5.3		ND ND ND	23 16 46	280 200 550	ND ND ND		6.8 3.3 2	20 21 170	18 11 140	2 3 ND							
Well (West to East) Sample Depth (ft bgs)	300	350	V-89 400	450	-	300	350	400	450	-																	
Parameter (μg/L) Tetrachloroethylene Trichloroethylene Vinyl Chloride	9 26 19	32 48 50	63 25 7	9.3 12 ND		67 17 22	19 6.4 10	43 19 3.5	ND ND ND																		

Note

^{(1) 2005/2006} Pilot System Installation Results

TABLE 3.3

Well Designation	Date Completed	Ground Surface	Measuring Point Elevation ⁽¹⁾	-	p of łpack	Sci	p of reen	Sc	tom of reen		om of dpack	Well Diameter	Well Screen Slot Size	Well Material
		(ft amsl)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(in)		
IW-1D1A	04/28/11	121.93	NA	185.0	-63.1	190.0	-68.1	195.0	-73.1	200.0	-78.1	1.25	10	BI/SS
IW-1D1L	04/28/11	121.93	NA	215.0	-93.1	220.0	-98.1	230.0	-108.1	235.0	-113.1	1.25	10	Sch. 80 PVC
IW-1D2A	04/28/11	121.93	NA	255.0	-133.1	260.0	-138.1	265.0	-143.1	270.0	-148.1	1.25	10	BI/SS
IW-2D1A	04/8/11	122.72	NA	195.0	-72.3	200.0	-77.3	205.0	-82.3	210.0	-87.3	1.25	10	BI/SS
IW-2D1L	04/8/11	122.72	NA	220.0	-97.3	225.0	-102.3	235.0	-112.3	240.0	-117.3	1.25	10	Sch. 80 PVC
IW-2D2A	04/8/11	122.72	NA	255.0	-132.3	260.0	-137.3	265.0	-142.3	270.0	-147.3	1.25	10	BI/SS
IW-3D1A	03/25/11	121.73	NA	195.0	-73.3	200.0	-78.3	205.0	-83.3	210.0	-88.3	1.25	10	BI/SS
IW-3D1L	03/25/11	121.73	NA	215.0	-93.3	225.0	-103.3	235.0	-113.3	240.0	-118.3	1.25	10	Sch. 80 PVC
IW-3D2A	03/25/11	121.73	NA	255.0	-133.3	260.0	-138.3	265.0	-143.3	270.0	-148.3	1.25	10	BI/SS
IW-4D1A	01/27/11	121.76	NA	220.0	-98.2	225.0	-103.2	230.0	-108.2	235.0	-113.2	1.25	10	BI/SS
IW-4D1L	01/27/11	121.76	NA	240.0	-118.2	245.0	-123.2	255.0	-133.2	260.0	-138.2	1.25	10	Sch. 80 PVC
IW-4D2A	01/27/11	121.76	NA	270.0	-148.2	275.0	-153.2	280.0	-158.2	285.0	-163.2	1.25	10	BI/SS
IW-5D1A	04/12/11	122.22	NA	210.0	-87.8	215.0	-92.8	220.0	-97.8	225.0	-102.8	1.25	10	BI/SS
IW-5D1L	04/12/11	122.22	NA	255.0	-132.8	260.0	-137.8	270.0	-147.8	275.0	-152.8	1.25	10	Sch. 80 PVC
IW-5D2A	04/12/11	122.22	NA	295.0	-172.8	300.0	-177.8	305.0	-182.8	310.0	-187.8	1.25	10	BI/SS
IW-6D1A	01/17/11	123.75	NA	250.0	-126.3	255.0	-131.3	260.0	-136.3	265.0	-141.3	1.25	10	BI/SS
IW-6D1L	01/17/11	123.75	NA	270.0	-146.3	275.0	-151.3	285.0	-161.3	290.0	-166.3	1.25	10	Sch. 80 PVC
IW-6D2A	01/17/11	123.75	NA	295.0	-171.3	300.0	-176.3	305.0	-181.3	310.0	-186.3	1.25	10	BI/SS
IW-7D1A	03/29/11	125.78	NA	260.0	-134.2	265.0	-139.2	270.0	-144.2	290.0	-164.2	1.25	10	BI/SS
IW-7D1L	03/29/11	125.78	NA	260.0	-134.2	275.0	-149.2	285.0	-159.2	290.0	-164.2	1.25	10	Sch. 80 PVC
IW-7D2A	03/29/11	125.78	NA	295.0	-169.2	300.0	-174.2	305.0	-179.2	310.0	-184.2	1.25	10	BI/SS
IW-15D1A	10/05/10	119.95	NA	348.0	-228.1	355.0	-235.1	360.0	-240.1	361.0	-241.1	1.25	10	BI/SS
IW-15DlL	10/05/10	119.95	NA	366.0	-246.1	368.0	-248.1	378.0	-258.1	379.0	-259.1	1.25	10	BI/SS
IW-15D2A	10/05/10	119.95	NA	401.0	-281.1	406.0	-286.1	411.0	-291.1	416.0	-296.1	1.25	10	BI/SS
IW-16D1A	11/01/05	121.6	NA	380.0	-258.4	395.0	-273.4	400.0	-278.4	401.0	-279.4	1.0	10	BI/SS
IW-16D1L	11/01/05	121.6	NA	380.0	-258.4	385.0	-263.4	400.0	-278.4	401.0	-279.4	1.0	10	Sch. 80 PVC
IW-16D2A	11/01/05	121.6	NA	420.0	-298.4	425.0	-303.4	430.0	-308.4	435.0	-313.4	1.0	10	BI/SS
IW-17D1A	12/01/05	121.8	NA	330.0	-208.2	345.0	-223.2	350.0	-228.2	355.0	-233.2	1.0	10	BI/SS
IW-17D1L	12/01/05	121.8	NA	330.0	-208.2	335.0	-213.2	350.0	-228.2	355.0	-233.2	1.0	10	Sch. 80 PVC
IW-17D2A	12/01/05	121.8	NA	415.0	-293.2	420.0	-298.2	425.0	-303.2	429.5	-307.7	1.0	10	BI/SS
IW-18D1A	01/09/06	121.5	NA	344.75	-223.3	359.83	-238.3	364.83	-243.3	367.0	-245.5	1.0	10	BI/SS
IW-18D1L	01/09/06	121.5	NA	344.75	-223.3	349.83	-228.3	364.83	-243.3	367.0	-245.5	1.0	10	Sch. 80 PVC
IW-18D2A	01/09/06	121.5	NA	412.0	-290.5	420.0	-298.5	425.0	-303.5	430.0	-308.5	1.0	10	BI/SS
IW-19D1A	01/13/06	121.1	NA	337.0	-215.9	355.0	-233.9	360.0	-238.9	360.5	-239.4	1.0	10	BI/SS
IW-19D1L	01/13/06	121.1	NA	337.0	-215.9	345.0	-223.9	360.0	-238.9	360.5	-239.4	1.0	10	Sch. 80 PVC

TABLE 3.3

Well Designation	Date Completed	Ground Surface (ft amsl)	Measuring Point Elevation ⁽¹⁾ (ft amsl)		p of lpack (ft amsl)		p of reen (ft amsl)		tom of reen (ft amsl)		om of dpack (ft amsl)	Well Diameter (in)	Well Screen Slot Size	Well Material
IW-19D2A	01/13/06	121.1	NA	415.0	-293.9	420.0	-298.9	425.0	-303.9	430.0	-308.9	1.0	10	BI/SS
IW-20D1A	10/13/10	119.75	NA	362.0	-242.3	367.0	-247.3	372.0	-252.3	377.0	-257.3	1.25	10	BI/SS
IW-20D1L	10/13/10	119.75	NA	385.0	-265.3	390.0	-270.3	400.0	-280.3	402.0	-282.3	1.25	10	Sch. 80 PVC
IW-20D2A	10/13/10	119.75	NA	425.0	-305.3	430.0	-310.3	435.0	-315.3	440.0	-320.3	1.25	10	BI/SS
IW-21D1A	10/23/10	119.83	NA	370.0	-250.2	375.0	-255.2	380.0	-260.2	385.0	-265.2	1.25	10	BI/SS
IW-21D1L	10/23/10	119.83	NA	395.0	-275.2	400.0	-280.2	410.0	-290.2	411.0	-291.2	1.25	10	Sch. 80 PVC
IW-21D2A	10/23/10	119.83	NA	430.0	-310.2	435.0	-315.2	440.0	-320.2	445.0	-325.2	1.25	10	BI/SS
IW-22D1A	11/03/10	121.01	NA	350.0	-229.0	355.0	-234.0	360.0	-239.0	365.0	-244.0	1.25	10	BI/SS
IW-22D1L	11/03/10	121.01	NA	380.0	-259.0	385.0	-264.0	395.0	-274.0	396.0	-275.0	1.25	10	Sch. 80 PVC
IW-22D2A	11/03/10	121.01	NA	415.0	-294.0	420.0	-299.0	425.0	-304.0	430.0	-309.0	1.25	10	BI/SS
MW-50D1 ⁽²⁾	02/23/95	130.6	132.63	279	-148.4	285	-154.4	305	-174.4	305	-174.4	2	10	Sch. 80 PVC
$MW-50D2^{(2)}$	02/13/95	130.0	132.03	405	-275.0	415	-285.0	435	-305.0	435	-305.0	2	10	Sch. 80 PVC
MW-51D1	10/24/95	129.2	131.85	224	-94.8	235	-105.8	255	-125.8	260	-130.8	2	10	Sch. 80 PVC
MW-51D2	10/02/95	128.8	130.38	342	-213.2	350	-221.2	365	-236.2	370	-241.2	2	10	Sch. 80 PVC
MW-52S ⁽²⁾	01/17/96	125.8	125.48	119.4	6.4	125	0.8	140	-14.2	142	-16.2	2	10	Sch. 80 PVC
MW-52I ⁽²⁾	12/14/95	125.6	125.30	213.7	-88.1	220	-94.4	235	-109.4	237	-111.4	2	10	Sch. 80 PVC
$MW-52D^{(2)}$	12/12/95	126.1	125.88	366.2	-240.1	371	-244.9	386	-259.9	387	-260.9	2	10	Sch. 80 PVC
MW-53I	06/08/95	120.7	120.73	145	-24.3	150	-29.3	170	-49.3	173	-52.3	2	10	Sch. 80 PVC
MW-53D1	06/19/95	120.8	120.80	294	-173.2	300	-179.2	330	-209.2	335	-214.2	2	10	Sch. 80 PVC
MW-53D2	06/05/95	120.7	120.66	415	-294.3	430	-309.3	460	-339.3	460	-339.3	2	10	Sch. 80 PVC
$MW-56S^{(2)}$	01/26/96	133.9	133.60	98.5	35.4	105	28.9	120	13.9	123	10.9	2	10	Sch. 80 PVC
MW-56I ⁽²⁾	01/25/96	133.9	133.47	253.5	-119.6	260	-126.1	275	-141.1	280	-146.1	2	10	Sch. 80 PVC
MW-57S	01/23/96	127.9	127.68	131.7	-3.8	137	-9.1	152	-24.1	155.5	-27.6	2	10	Sch. 80 PVC
MW-57I	01/25/96	128.0	127.48	184.5	-56.5	191	-63.0	206	-78.0	208	-80.0	2	10	Sch. 80 PVC
MW-58D	03/26/02	116.22	115.99	395	-278.8	400	-283.8	410	-293.8	415	-298.8	2	10	BI/SS
MW-58D1	03/26/02	116.22	115.99	460	-343.8	465	-348.8	475	-358.8	480	-363.8	2	10	BI/SS
MW-58D2	03/26/02	116.22	115.99	495	-378.8	500	-383.8	510	-393.8	515	-398.8	2	10	BI/SS
MW-59D	04/06/02	117.37	117.13	395	-277.6	400	-282.6	410	-292.6	415	-297.6	2	10	BI/SS
MW-59D1	04/06/02	117.37	117.13	460	-342.6	465	-347.6	475	-357.6	480	-362.6	2	10	BI/SS
MW-59D2	04/06/02	117.37	117.13	495	-377.6	500	-382.6	510	-392.6	515	-397.6	2	10	BI/SS
MW-60D1	03/05/02	119.02	118.70	325	-206.0	330	-211.0	340	-221.0	345	-226.0	2	10	BI/SS
MW-60S	03/08/02	118.96	118.93	175	-56.0	180	-61.0	190	-71.0	195	-76.0	2	10	BI/SS
MW-60I	03/08/02	118.96	118.93	225	-106.0	230	- 111.0	240	-121.0	245	-126.0	2	10	BI/SS
MW-60D	03/08/02	118.96	118.93	275	-156.0	280	-161.0	290	-171.0	295	-176.0	2	10	BI/SS
MW-61S	02/22/02	121.19	120.91	165	-43.8	170	-48.8	180	-58.8	185	-63.8	2	10	BI/SS

TABLE 3.3

Well Designation	Date Completed	Ground Surface	Measuring Point Elevation ⁽¹⁾	-	p of lpack	Sci	p of reen	Sc	tom of reen	San	om of dpack	Well Diameter	Well Screen Slot Size	Well Material
		(ft amsl)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(in)		
MW-61I	02/22/02	121.19	120.91	200	-78.8	205	-83.8	215	-93.8	220	-98.8	2	10	BI/SS
MW-61D1	02/22/02	121.19	120.91	265	-143.8	270	-148.8	280	-158.8	285	-163.8	2	10	BI/SS
MW-61D2	03/12/02	121.15	121.05	360	-238.9	365	-243.9	375	-253.9	380	-258.9	2	10	BI/SS
MW-62I	05/14/02	128.27	128.15	255	-126.7	260	<i>-</i> 131.7	270	-141.7	275	-146.7	2	10	Sch. 80 PVC
MW-62D	04/20/02	128.03	127.82	325	-197.0	330	-202.0	340	-212.0	345	-217.0	2	10	BI/SS
MW-63S	02/18/02	118.67	118.45	175	-56.3	180	-61.3	190	-71.3	195	-76.3	2	10	Sch. 80 PVC
MW-63I	02/18/02	118.67	118.45	210	-91.3	215	-96.3	225	-106.3	230	-111.3	2	10	Sch. 80 PVC
MW-63D1	02/18/02	118.67	118.45	245	-126.3	250	- 131.3	260	-141.3	265	-146.3	2	10	Sch. 80 PVC
MW-63D2	02/18/02	118.67	118.45	280	-161.3	285	-166.3	295	-176.3	300	-181.3	2	10	Sch. 80 PVC
MW-64S	02/09/02	125.66	125.59	175	-49.3	180	-54.3	190	-64.3	200	-74.3	2	10	Sch. 80 PVC
MW-64I	02/09/02	125.66	125.59	245	-119.3	250	-124.3	260	-134.3	265	-139.3	2	10	Sch. 80 PVC
MW-64D	02/09/02	125.66	125.59	285	-159.3	290	-164.3	300	-174.3	305	-179.3	2	10	Sch. 80 PVC
$MW-66D2^{(2)}$	06/08/02	118.60	118.15	450	-331.4	455	-336.4	465	-346.4	475	-356.4	2	10	BI/SS
MW-66I ⁽²⁾	06/19/02	118.27	118.20	290	-171.7	295	-176.7	305	-186.7	310	-191.7	2	10	BI/SS
MW-66D1 ⁽²⁾	06/19/02	118.27	118.20	350	-231.7	355	-236.7	365	-246.7	320	-201.7	2	10	BI/SS
MW-67S	01/11/03	118.68	118.37	440.0	-321.3	445.0	-326.3	455.0	-336.3	460.0	-341.3	2	10	BI/SS
MW-67D	01/11/03	118.68	118.33	490.0	-371.3	495.0	-376.3	505.0	-386.3	510.0	-391.3	2	10	BI/SS
MW-68S	02/09/03	119.20	118.97	455.0	-335.8	457.0	-337.8	467.0	-347.8	470.0	-350.8	2	10	BI/SS
MW-68D	02/09/03	119.20	119.00	485.0	-365.8	490.0	-370.8	500.0	-380.8	505.0	-385.8	2	10	BI/SS
MW-70D1	02/02/11	120.27	119.53	191.0	-70.7	196.0	<i>-7</i> 5.7	206.0	-85.7	211.0	-90.7	2	10	BI/SS
MW-70D2	02/02/11	120.27	119.14	241.0	-120.7	246.0	-125.7	256.0	-135.7	257.0	-136.7	2	10	BI/SS
MW-72D1	03/16/11	119.66	118.23	195.0	<i>-</i> 75.3	200.0	-80.3	210.0	-90.3	215.0	-95.3	2	10	BI/SS
MW-72D2	03/16/11	119.66	118.52	255.0	-135.3	260.0	-140.3	270.0	-150.3	271.0	-151.3	2	10	BI/SS
MW-73D1	02/11/11	121.44	119.66	215.0	-93.6	220.0	-98.6	230.0	-108.6	235.0	-113.6	2	10	BI/SS
MW-73D2	02/11/11	121.44	120.10	255.0	-133.6	260.0	-138.6	270.0	-148.6	271.0	-149.6	2	10	BI/SS
MW-75D1	05/02/11	118.85	117.85	155.0	-36.2	160.0	-41.2	170.0	-51.2	175.0	-56.2	2	10	BI/SS
MW-75D2	05/02/11	119.04	118.21	220.0	-101.0	225.0	-106.0	235.0	-116.0	236.0	-117.0	2	10	BI/SS
MW-76S	03/03/11	120.21	119.05	75.0	45.2	80.0	40.2	90.0	30.2	95.0	25.2	2	10	BI/SS
MW-76I	03/03/11	120.21	118.97	120.0	0.2	125.0	-4.8	135.0	-14.8	136.0	-15.8	2	10	BI/SS
MW-76D1	02/15/11	119.51	118.80	190.0	-70.5	195.0	<i>-7</i> 5.5	205.0	-85.5	210.0	-90.5	2	10	BI/SS
MW-76D2	02/15/11	119.51	118.86	260.0	-140.5	265.0	-145.5	275.0	-155.5	276.0	-156.5	2	10	BI/SS
MW-77D1	02/26/11	122.47	121.23	240.0	-117.5	245.0	-122.5	255.0	-132.5	260.0	-137.5	2	10	BI/SS
MW-77D2	02/26/11	122.47	121.72	290.0	-167.5	295.0	-172.5	305.0	-182.5	306.0	-183.5	2	10	Sch. 80 PVC
MW-81D1	11/01/05	121.60	121.07	300.0	-178.40	305.0	-183.4	315.0	-193.4	319.0	-197.4	2	10	Sch. 80 PVC
MW-81D2	11/01/05	121.60	121.05	397.0	-275.40	405.0	-283.4	415.0	-293.4	416.0	-294.4	2	10	Sch. 80 PVC

TABLE 3.3

Well Designation	Date Completed	Ground Surface	Measuring Point Elevation ⁽¹⁾		p of dpack		p of reen		tom of reen		tom of dpack	Well Diameter	Well Screen Slot Size	Well Material
J	·	(ft amsl)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(in)		
MW-82D1	02/15/06	120.50	120.14	337.0	-216.50	345.0	-224.5	355.0	-234.5	355.5	-235.0	2	10	Sch. 80 PVC
MW-82D2	02/15/06	120.50	120.15	404.8	-284.30	409.4	-288.9	419.4	-298.9	420.5	-300.0	2	10	BI/SS
MW-83D1	11/06/05	121.58	120.99	300.0	-178.42	305.0	-183.4	315.0	-193.4	321.0	-199.4	2	10	Sch. 80 PVC
MW-83D2	11/06/05	121.58	121.02	385.0	-263.42	390.0	-268.4	400.0	-278.4	401.0	-279.4	2	10	Sch. 80 PVC
MW-84D1	04/12/06	121.34	120.90	335.6	-214.26	345.0	-223.7	355.0	-233.7	358.0	-236.7	2	10	Sch. 80 PVC
MW-84D2	04/12/06	121.34	120.94	382.6	-261.26	390.6	-269.3	400.6	-279.3	405.0	-283.7	2	10	BI/SS
MW-85S	12/04/10	119.30	118.20	213.0	-93.70	218.0	-98.7	228.0	-108.7	233.0	-113.7	2	10	BI/SS
MW-85I	12/04/10	119.30	118.28	273.0	-153.7	277.0	-157.7	287.0	-167.7	287.0	-167.7	2	10	BI/SS
MW-85D1	12/02/10	119.30	118.20	335.0	-215.7	340.0	-220.7	350.0	-230.7	355.0	-235.7	2	10	BI/SS
MW-85D2	12/02/10	119.30	118.47	390.0	-270.7	395.0	-275.7	405.0	-285.7	407.0	-287.7	2	10	BI/SS
MW-86D1	11/11/10	118.96	117.77	195.0	-76.0	200.0	-81.0	210.0	-91.0	215.0	-96.0	2	10	BI/SS
MW-86D2	11/11/10	118.96	117.84	345.0	-226.0	350.0	-231.0	360.0	-241.0	365.0	-246.0	2	10	BI/SS
MW-87D1	10/04/05	121.05	120.55	299.0	-177.95	307.0	-186.0	317.0	-196.0	319.0	-198.0	2	10	Sch. 80 PVC
MW-87D2	10/04/05	121.05	120.55	400.0	-278.95	405.0	-284.0	415.0	-294.0	416.0	-295.0	2	10	Sch. 80 PVC
MW-88D1	03/21/06	120.89	120.17	297.7	-176.81	305.0	-184.1	315.0	-194.1	320.4	-199.5	2	10	Sch. 80 PVC
MW-88D2	03/21/06	120.89	120.05	398.5	-277.61	405.6	-284.7	415.6	-294.7	416.0	-295.1	2	10	BI/SS
MW-89D1	12/19/10	119.30	117.97	340.0	-220.7	345.0	-225.7	355.0	-235.7	360.0	-240.7	2	10	BI/SS
MW-89D2	12/19/10	119.30	118.19	375.0	-255.7	380.0	-260.7	390.0	-270.7	391.0	-271.7	2	10	BI/SS
MW-90D1	03/28/06	123.31	122.93	222.0	-98.69	238.0	-114.7	243.0	-119.7	245.0	-121.7	1.5	10	BI/SS
MW-90D2	03/28/06	123.29	122.85	262.0	-138.71	267.0	-143.7	272.0	-148.7	280.0	-156.7	1.5	10	BI/SS
MW-92D1	03/11/11	123.65	121.28	205.0	-81.4	210.0	-86.4	220.0	-96.4	225.0	-101.4	2	10	BI/SS
MW-92D2	03/11/11	122.21	121.50	250.0	-127.8	255.0	-132.8	265.0	-142.8	266.0	-143.8	2	10	BI/SS
MW-93D1	03/03/11	123.65	122.93	200.0	-76.4	205.0	-81.4	215.0	-91.4	220.0	-96.4	2	10	BI/SS
MW-93D2	03/03/11	123.65	122.46	255.0	-131.4	260.0	-136.4	270.0	-146.4	271.0	-147.4	2	10	BI/SS
VZ-1S	03/15/11	119.66	118.16	4.0	115.66	6.0	113.7	8.0	111.7	9.0	110.7	1.0	10	Sch. 40 PVC
VZ-1D	03/15/11	119.66	118.06	39.0	80.66	41.0	78.7	46.0	73.7	47.0	72.7	1.0	10	Sch. 40 PVC
VZ-2S	02/12/11	121.44	120.17	4.0	117.44	6.0	115.4	8.0	113.4	8.5	112.9	1.0	10	Sch. 40 PVC
VZ-2D	02/12/11	121.44	120.21	42.0	79.44	44.0	77.4	49.0	72.4	57.0	64.4	1.0	10	Sch. 40 PVC
VZ-4S	04/30/11	118.85	117.84	4.0	114.85	6.0	112.9	8.0	110.9	9.0	109.9	1.0	10	Sch. 40 PVC
VZ-4D	04/30/11	118.85	117.74	41.0	77.85	43.0	75.9	48.0	70.9	50.0	68.9	1.0	10	Sch. 40 PVC
VZ-5S	03/11/11	119.51	118.16	4.0	115.51	6.0	113.5	8.0	111.5	9.0	110.5	1.0	10	Sch. 40 PVC
VZ-5D	03/11/11	119.51	118.16	39.0	80.51	41.0	78.5	46.0	73.5	47.0	72.5	1.0	10	Sch. 40 PVC
VZ-6S	02/26/11	122.47	121.09	4.0	118.47	6.0	116.5	8.0	114.5	9.0	113.5	1.0	10	Sch. 40 PVC
VZ-6D	02/26/11	122.47	121.13	42.0	80.47	44.0	78.5	49.0	73.5	57.0	65.5	1.0	10	Sch. 40 PVC
VZ-10S	01/19/06	121.90	121.81	4.0	117.90	6.0	115.9	8.0	113.9	8.5	113.4	1.0	10	Sch. 40 PVC

TABLE 3.3

			Measuring										Well	
Well	Date	Ground	Point	To	p of	To	p of	Bott	tom of	Bott	om of	Well	Screen	Well
Designation	Completed	Surface	Elevation ⁽¹⁾	Sand	łpack	Sc	reen	Sc	reen	San	dpack	Diameter	Slot Size	Material
		(ft amsl)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(ft bgs)	(ft amsl)	(in)		
VZ-10D	01/19/06	121.90	121.81	49.0	72.90	51.0	70.9	56.0	65.9	60.0	61.9	1.0	10	Sch. 40 PVC
VZ-11S	02/28/06	121.35	120.64	4.0	117.35	6.0	115.4	8.0	113.4	8.5	112.9	1.0	10	Sch. 40 PVC
VZ-11D	02/28/06	121.35	120.60	42.0	79.35	44.0	77.4	49.0	72.4	63.0	58.4	1.0	10	Sch. 40 PVC
VZ-12S	12/05/10	119.30	117.98	4.0	115.3	6.0	113.3	8.0	111.3	8.5	110.8	1.0	10	Sch. 40 PVC
VZ-12D	12/05/10	119.30	118.09	41.5	77.8	43.5	75.8	48.5	70.8	49.0	70.3	1.0	10	Sch. 40 PVC
VZ-14S	10/07/05	121.32	120.97	4.0	117.32	6.0	115.3	8.0	113.3	8.5	112.8	1.0	10	Sch. 40 PVC
VZ-14D	10/07/05	121.32	121.01	47.0	74.32	49.0	72.3	54.0	67.3	69.0	52.3	1.0	10	Sch. 40 PVC
VZ-15S	11/04/05	121.46	121.31	4.0	117.46	6.0	115.5	8.0	113.5	12.5	109.0	1.0	10	Sch. 40 PVC
VZ-15D	11/04/05	121.46	121.32	49.0	72.46	51.0	70.5	56.0	65.5	63.0	58.5	1.0	10	Sch. 40 PVC
VZ-16S	01/23/06	120.42	120.13	4.0	116.42	6.0	114.4	8.0	112.4	8.5	111.9	1.0	10	Sch. 40 PVC
VZ-16D	01/23/06	120.42	120.27	49.0	71.42	51.0	69.4	56.0	64.4	60.0	60.4	1.0	10	Sch. 40 PVC
VZ-17S	12/20/10	119.30	117.98	4.0	115.3	6.0	113.3	8.0	111.3	8.5	110.8	1.0	10	Sch. 40 PVC
VZ-17D	12/20/10	119.30	118.01	31.0	88.3	33.0	86.3	38.0	81.3	50.0	69.3	1.0	10	Sch. 40 PVC

Notes:

(1) Measuring Point is generally top of well riser pipe. Measuring point is marked.

(2) Abandoned

amsl above mean sea levelbgs below ground surfaceBI Black Steel Riser

SS Stainless Steel Well Screen

PVC Polyvinyl Chloride NA Not Applicable

TABLE 3.4

VOLUME OF NORTHROP GP-1/GP-3 SYSTEM TREATED WATER INJECTED OPERABLE UNIT 3 HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Start Date	End Date	Water (gal.)				
4/6/07	5/2/07	295,910				
5/2/07	6/4/07	453,330				
6/4/07	7/6/07	404,500				
7/6/07	8/2/07	163,940				
8/2/07	8/31/07	344,660				
8/31/07	10/3/07	308,190				
10/3/07	10/21/07	193,650				
10/21/07	11/29/07	343,010				
11/29/07	1/4/08	249,880				
1/4/08	1/31/08	235,070				
1/31/08	3/4/08	379,720				
3/4/08	4/3/08	299,620				
4/3/08	5/7/08	158,440				
5/7/08	5/30/08	138,380				
5/30/08	6/30/08	27,930				
6/30/08	7/31/08	168,620				
7/31/08	9/5/08	394,613				
9/5/08	10/3/08	280,157				
10/3/08	10/22/08	78,230				
10/22/08	11/26/08	146,890				
11/26/08	12/6/08	158,520				
12/6/08	2/10/09	0				
2/10/09	2/26/09	201,710				
2/26/09	3/30/09	334,980				
3/30/09	4/15/09	69,100				
4/15/09	6/1/09	418,610				
6/1/09	7/1/09	293,480				
7/1/09	7/28/09	210,600				
7/28/09	9/3/09	221,400				
9/3/09	10/16/09	90,000				
10/16/09	11/5/09	421,200				
11/5/09	12/2/09	396,830				
12/2/09	12/29/09	408,038				
12/29/09	1/25/10	343,237				
1/25/10	3/1/10	275,615				
3/1/10	4/1/10	0				
4/1/10	8/18/10	555,440				
8/18/10	9/21/10	335,350				
9/21/10	2/8/11	55,040				
2/8/11	2/28/11	106,570				
2/28/11	3/31/11	135,030				
3/31/11	5/3/11	55,830				
5/3/11	6/6/11	265,700				
6/6/11	7/5/11	197,290				

TABLE 3.4

VOLUME OF NORTHROP GP-1/GP-3 SYSTEM TREATED WATER INJECTED OPERABLE UNIT 3 HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Start Date	End Date	Water (gal.)				
7/5/11	8/11/11	4,190				
8/11/11	8/31/11	190				
8/31/11	10/1/11	0				
10/1/11	10/31/11	0				
10/31/11	11/30/11	0				
11/30/11	1/3/12	154,270				
1/3/12	2/6/12	307,320				
2/6/12	3/1/12	215,250				
3/1/12	4/3/12	0				
4/3/12	8/31/12	0				

TABLE 7.1

SUMMARY OF PERFORMANCE MONITORING ⁽¹⁾ OU-3 BIOSPARGE REMEDY HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Pilot System

		r tiot system	
Media	Location	Frequency	Parameters
Groundwater	MW-61I/D1/D2 MW-82	 Background ⁽²⁾ Monthly for First Quarter Quarterly for remainder of first 2 years of operation 	 VOCs + TICs⁽³⁾, TOC, N, P, DO, ORP, pH, Temperature, Conductivity, Fe⁺² Heterotrophic microorganisms annually
	MW-83, MW-84	 Background ⁽²⁾ Quarterly for first 2 years of operation 	 VOCs + TICs⁽³⁾, TOC, N, P, DO, ORP, pH, Temperature, Conductivity, Fe⁺² Heterotrophic microorganisms annually
	MW-81, MW-87, MW-88	 Background ⁽²⁾ Quarterly for first year of operation Semi-annual for second year 	 VOCs + TICs⁽³⁾, TOC, N, P, DO, ORP, pH, Temperature, Conductivity, Fe⁺² Heterotrophic microorganisms annually
	All Pilot System MW Wells	Semi-annual since October 2008	- VOCs, TOC, N, P, DO, ORP, pH, Temperature, Conductivity, Fe ⁺²
Soil Gas (No Further Sampling of Pilot System VZ Wells)	VZ-10, VZ-11	 Background ⁽²⁾ Shortly after initial Air Injection Monthly for First Quarter Quarterly for remainder of first 2 years of operation 	Monitor with PIDIf elevated PID reading collect sample for VOCs and methane
		- Thereafter Semi-Annually until November 2010	- VOCs and methane
	VZ-14, VZ-15, VZ-16	- Background ⁽²⁾ - Semi-Annually	 Monitor with PID VOCs and methane
Ambient Air	(4)	- Semi-Annually	- If elevated PID reading collect sample for VOCs and methane
Liquid Supplements	Mixing Unit	- Prior to use once annually for a maximum of 3 times	- TOC, N, P

TABLE 7.1

SUMMARY OF PERFORMANCE MONITORING ⁽¹⁾ OU-3 BIOSPARGE REMEDY HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Remainder of Biosparge System

Media	Location	Frequency	Parameters
Groundwater	MW-70, MW-72, MW-73, MW-75 MW-76, MW-77 MW-85, MW-86, MW-89, MW-90	 Background ⁽⁵⁾ Quarterly for first 2 years of operation Semi-Annual thereafter 	 VOCs + TICs⁽³⁾, TOC, N, P, DO, ORP, pH, Temperature, Conductivity, Fe⁺² Heterotrophic microorganisms⁽⁶⁾
Soil Gas	VZ-1, VZ-2 VZ-4, VZ-5 VZ-6, VZ-12 VZ-17	 Background ⁽⁵⁾ Quarterly for first year of operation 	Monitor with PIDIf elevated PID reading, collect sample for VOCs and methane
		- Semi-Annually for second year of operation	- VOCs and methane
Ambient Air	(4)	- Semi-Annually	 If elevated PID reading collect sample for VOCs and methane
Liquid Supple	ments Included in Phase I		
Notes:			
(1) (2)	Background monitoring was performed at the Monitoring was once 2 weeks before the init	ceipt of first 3 years of monitoring results for the entire sy hose wells associated with the Pilot System prior to initial ial injection and then daily for the first 3 days immediate DO and ORP occurred on the first 4 days following the s	l air injection . ely prior to the initial air injection. In
(3)	TICs will be analyzed/reported for first sam	apling event of each new well and next sampling event of ell will be performed. If TICs are present in a well, TIC at	
(4)	Ground Surface in vicinity of Shallow Vados	se Zone Well with the highest PID reading greater than 1	0 above background.
(5)	Background monitoring/sampling was be p	erformed once only prior to initial air injection (complete	ed).
(6)	Annually for first two years		

APPENDIX A

AS-RECORDED DRAWINGS

Drawing No.	Rev. No.	Date	Title
Civil/Structural			
CI-02	1	08/29/12	Injection Well Site Plan
CI-03	1	08/29/12	Injection Wells IW-16, 17, 18, 19
CI-04	1	08/29/12	Misc. Sections and Details
CI-05	1	08/29/12	Injection Wells IW-1 through IW-7 and CH-8
CI-06	1	08/29/12	Injection Wells IW-15, 20, 21, 22
ST-01	1	08/29/12	Control Building - General Notes
ST-02	1	08/29/12	Control Building -Floor Plan
ST-03	1	08/29/12	Control Building - Elevations
ST-04	1	08/29/12	Control Building -Section and Details
ST-05	1	08/29/12	Control Building -Schedule and Details
ST-06	1	08/29/12	Control Building -Foundation Plan
ST-07	1	08/29/12	Control Building - Miscellaneous Details

Drawing No.	Rev. No.	Date	Title
Engineering Flo	w Sheets		
EF-00	1	08/29/12	Engineering Flowsheet - Legend
EF-01 S1	1	08/29/12	Engineering Flowsheet - Process Equipment
EF-01 S1	1	08/29/12	Engineering Flowsheet - Process Equipment
EF-02	1	08/29/12	Engineering Flowsheet - Middle Fence Injection Wells
EF-03	1	08/29/12	Engineering Flowsheet - Middle Fence Injection Wells
EF-04	1	08/29/12	Engineering Flowsheet - Middle Fence Injection Wells
EF-05	1	08/29/12	Engineering Flowsheet - Middle Fence Injection Wells
EF-06	1	08/29/12	Engineering Flowsheet - North Fence Injection Wells
EF-07	1	08/29/12	Engineering Flowsheet - North Fence Injection Wells
EF-08	1	08/29/12	Engineering Flowsheet - North Fence Injection Wells

Drawing No.	Rev. No.	Date	Title
Mechanical / Pi	ping		
MP-01	1	08/29/12	Control Building and Well - Field Piping Plan
MP-02	1	08/29/12	Control Building - Equipment Layout at Grade
MP-03	1	08/29/12	Control Building - Equipment Layout (Upper)
MP-04	1	08/29/12	Control Building - Equipment Sections
MP-05	1	08/29/12	Well Details
MP-06	1	08/29/12	Injection Wells IW-16, 17, 18 & 19 - Plan and Sections
MP-07	1	08/29/12	Injection Wells IW-15, 20, 21 & 22 - Plan and Sections
MP-08	1	08/29/12	Lavatory Plumbing
MP-09	1	08/29/12	Injection Well IW-08 - Plan and Sections
MP-10	1	08/29/12	Injection Wells IW-01 Thru IW-07 - Plan and Sections
MP-11	1	08/29/12	Removed
MP-12	1	08/29/12	Line List
MP-13	1	08/29/12	Injection Wells IW-21A - Plan and Sections
MP-14	1	08/29/12	Injection Wells IW-21 - Plan and Sections

Drawing No.	Rev. No.	Date	Title
Electrical / Instr	umentation		
E-01	1	08/29/12	Electrical Instrumentation Site Plan
E-02	1	08/29/12	Control Building Single Line Diagram
E-03	1	08/29/12	Control Building - Grounding Plan and Details
E-04	1	08/29/12	Control Building - Lighting Plan and Details
E-05	1	08/29/12	Control Building - Panelboard Schedules
E-06	1	08/29/12	Control Building Power Plan
E-07 SHT.1	1	08/29/12	Control Building Motor Schematic Diagrams
E-07 SHT.2	1	08/29/12	Control Building Motor Schematic Diagrams
E-08	1	08/29/12	Control System Network Architecture
E-09	1	08/29/12	Control Building Instrumentation Plan and Details
E-10	1	08/29/12	Main PLC Control Panel Arrangement
E-11-SHT.1	1	08/29/12	Main PLC Control Panel Wiring Diagram
E-11-SHT.2	1	08/29/12	Main PLC Control Panel Analog Input Wiring Diagram
E-11-SHT.3	1	08/29/12	Main PLC Control Panel Analog Output Wiring Diagram
E-11-SHT.4	1	08/29/12	Main PLC Control Panel Digital Input Wiring Diagram (1 of 2)
E-11-SHT.5	1	08/29/12	Main PLC Control Panel Digital Input Wiring Diagram (2 of 2)
E-11-SHT.6	1	08/29/12	Main PLC Control Panel Digital Output Wiring Diagram
E-12	1	08/29/12	Injection Wells Plan, Section and Details
E-13	1	08/29/12	Injection Wells Heat Tracing Plan, Section and Details
E-14	1	08/29/12	Injection Wells Typical Electrical Wiring Diagram
E-15	1	08/29/12	Typical Injection Well Remote I/O Panel Arrangement
E-16 SHT.1	1	08/29/12	Injection Well IW-1 Remote I/O Panel Wiring Diagram
E-16 SHT.2	1	08/29/12	Injection Well IW-2 Remote I/O Panel Wiring Diagram
E-16 SHT.3	1	08/29/12	Injection Well IW-3 Remote I/O Panel Wiring Diagram
E-16 SHT.4	1	08/29/12	Injection Well IW-4 Remote I/O Panel Wiring Diagram
E-16 SHT.5	1	08/29/12	Injection Well IW-5 Remote I/O Panel Wiring Diagram
E-16 SHT.6	1	08/29/12	Injection Well IW-6 Remote I/O Panel Wiring Diagram
E-16 SHT.7	1	08/29/12	Injection Well IW-7 Remote I/O Panel Wiring Diagram
E-16 SHT.15	1	08/29/12	Injection Well IW-15 Remote I/O Panel Wiring Diagram
E-16 SHT.16	1	08/29/12	Injection Well IW-16 Remote I/O Panel Wiring Diagram
E-16 SHT.17	1	08/29/12	Injection Well IW-17 Remote I/O Panel Wiring Diagram
E-16 SHT.18	1	08/29/12	Injection Well IW-18 Remote I/O Panel Wiring Diagram
E-16 SHT.19	1	08/29/12	Injection Well IW-19 Remote I/O Panel Wiring Diagram
E-16 SHT.20	1	08/29/12	Injection Well IW-20 Remote I/O Panel Wiring Diagram
E-16 SHT.21	1	08/29/12	Injection Well IW-21 Remote I/O Panel Wiring Diagram
E-16 SHT.22	1	08/29/12	Injection Well IW-22 Remote I/O Panel Wiring Diagram

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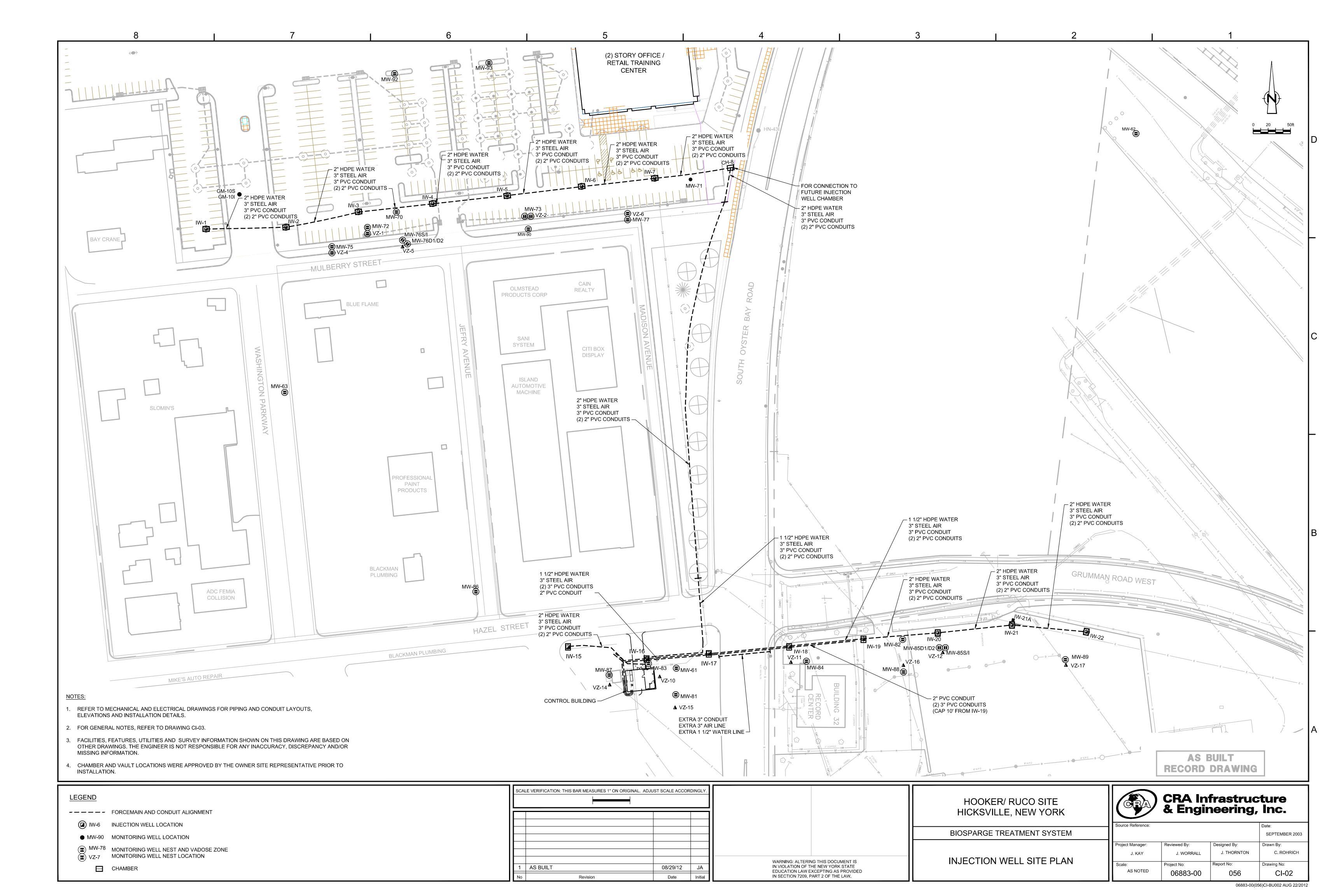
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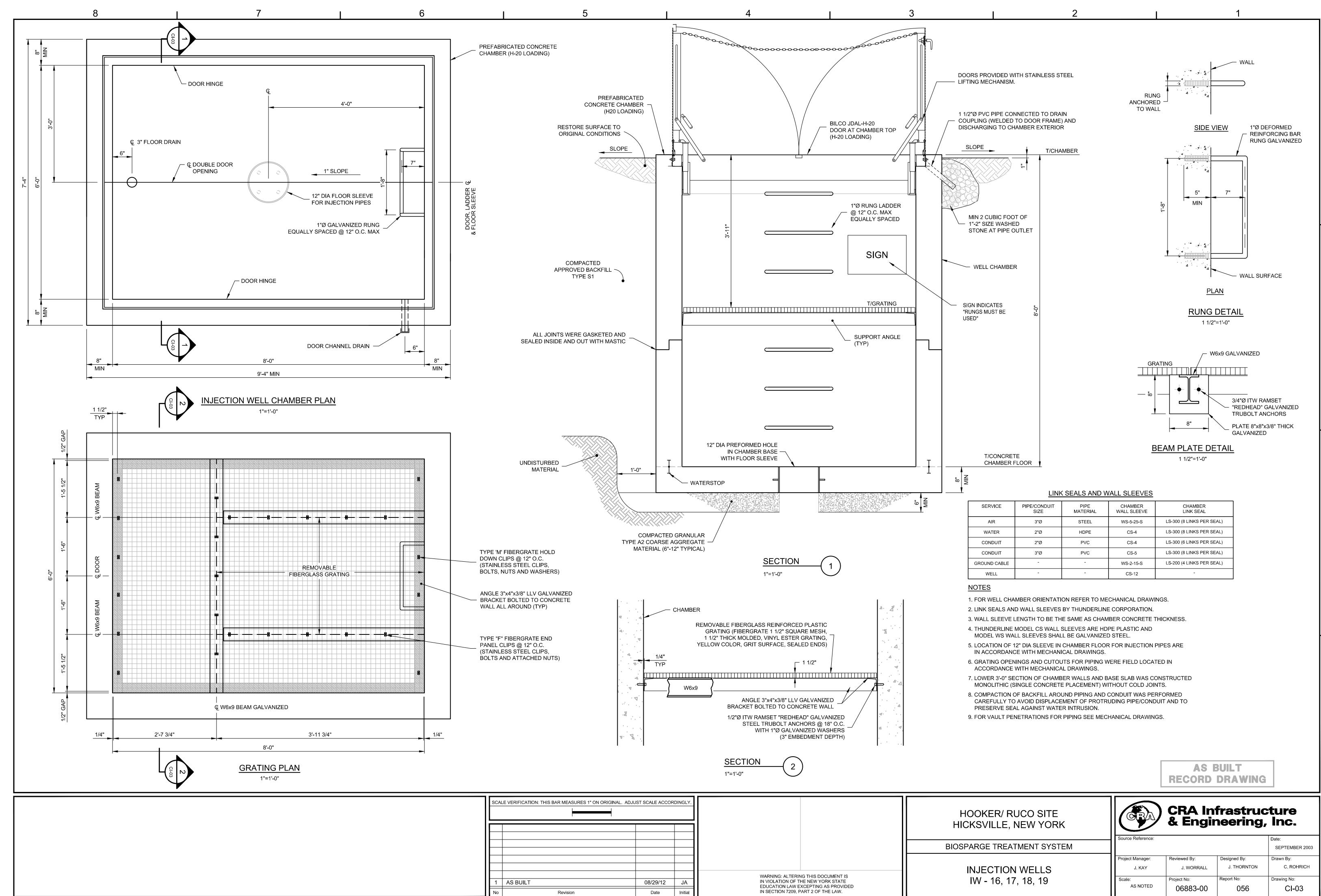
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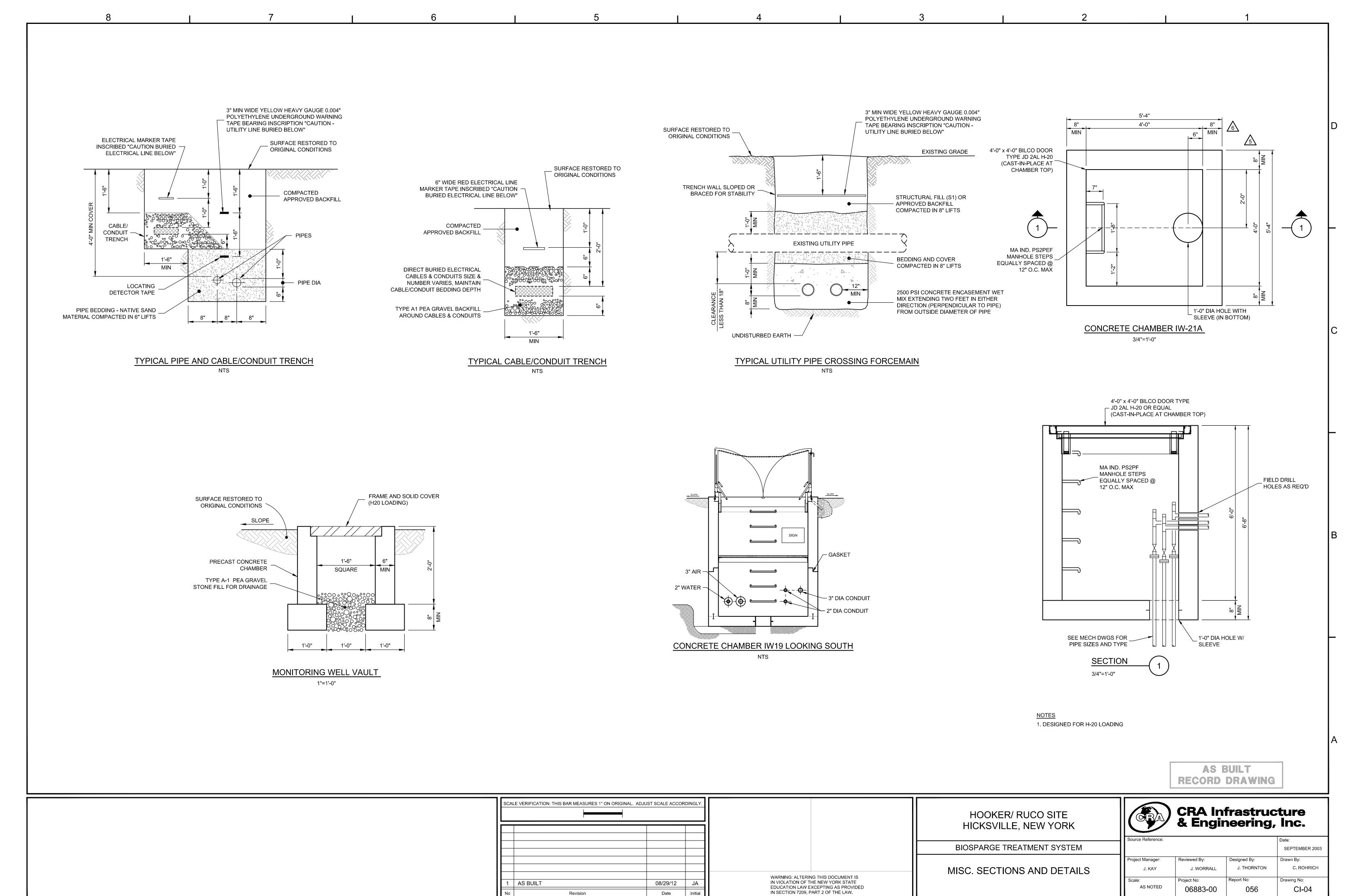
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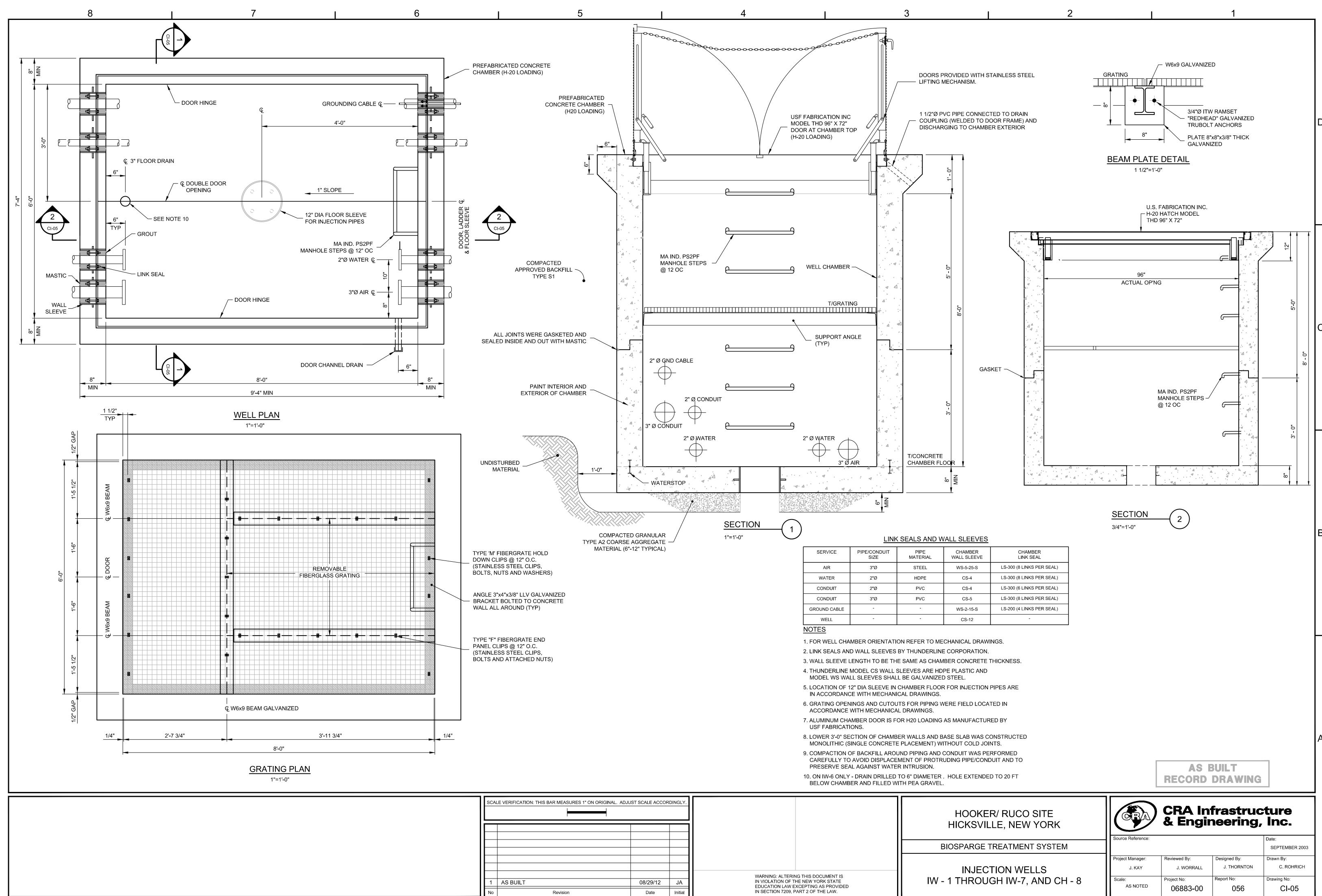




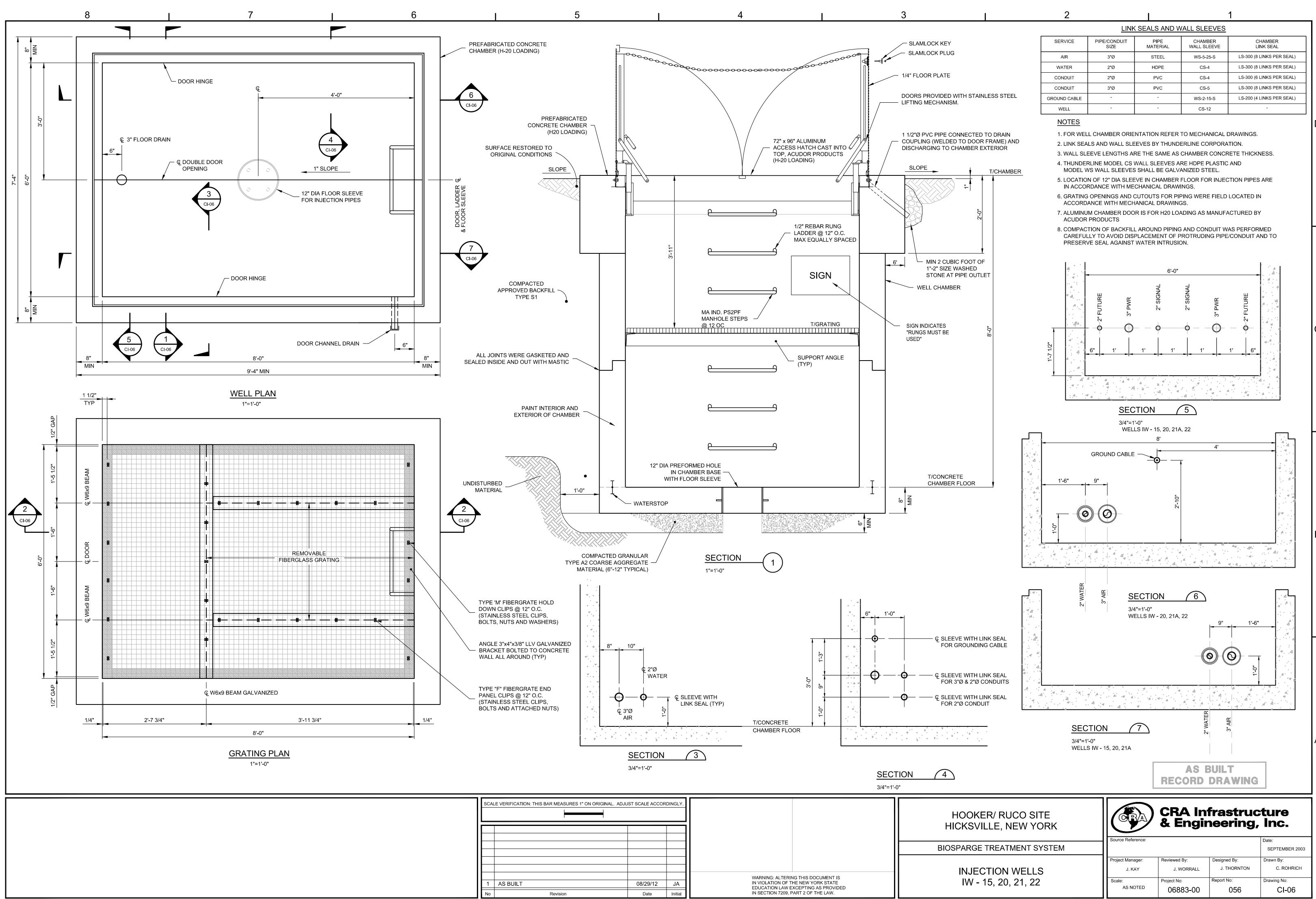
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GENERAL NOTES

- THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS TO ESTABLISH DIMENSIONS. ALL DIMEN-SIONS SHALL BE CHECKED ON-SITE PRIOR TO ASSEMBLY OR CONSTRUCTION OF ANY WORK.
- 2. THE STRUCTURE HAS BEEN DESIGNED FOR THE IN-SERVICE LOADS. THE METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION TO BE USED ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. SUPPORTING FORMWORK FOR CONCRETE CONSTRUCTION SHALL NOT BE REMOVED BEFORE THE CONCRETE HAS GAINED SUFFICIENT STRENGTH TO SAFELY SUPPORT THE DEAD AND SUPERIMPOSED LOADS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID OVERLOADS, AND MAINTAIN AND INSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
- 3. THE CONTRACTOR SHALL REFER TO MECHANICAL & ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SIZE AND LOCATION OF SLEEVES, ANCHORS, INSERTS AND OPENINGS REQUIRED.
- 4. PRINCIPAL OPENINGS IN THE STRUCTURE ARE SHOWN ON THE DRAWINGS. SLEEVES AND OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS SHALL BE SUBJECT TO APPROVAL OF
- 5. MATERIALS SPECIFIED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL BE USED UNLESS THE CONTRACTOR OBTAINS WRITTEN APPROVAL OF THE ENGINEER TO USE ALTERNATIVE MATERIALS. WHEN REQUESTING SUCH APPROVAL, THE CONTRACTOR SHALL PROVIDE ADEQUATE AND DETAILED MANUFACTURER'S LITERATURE AND TECHNICAL DATA FOR EACH MATERIAL PRIOR TO ITS POTENTIAL

CONCRETE NOTES

- 1. CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301, 305, 306, 308, 315, 318 AND 350R SPECIFICATIONS.
- 2. LATEST REVISION AND/OR VERSION OF ALL CODES AND REFERENCE STANDARDS SHALL BE
- 3. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS. SLUMP SHALL BE 3 1/2 INCHES ± 1 INCH.
- 4. CONCRETE SHALL BE AIR ENTRAINED. CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II WITH AIR-ENTRAINING ADMIXTURE CONFORMING TO ASTM C260. AIR CONTENT (% BY VOLUME) SHALL NOT BE LESS THAN 4% NOR GREATER THAN 6.5% AND SHALL DEPEND ON MAXIMUM SIZE AGGREGATE USED.
- 5. NO ADMIXTURE SHALL CONTAIN CALCIUM CHLORIDE BASED COMPOUNDS. FLYASH AND POZZOLAN CONTENT SHALL NOT EXCEED 20% BY WEIGHT OF CEMENT.
- 6. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.
- 7. LAP SPLICES IN REINFORCING BARS SHALL BE A MINIMUM 38 TIMES BAR DIAMETERS.
- THE SPLICES SHALL NOT BE LESS THAN 18 INCHES.

 8. CONCRETE PROTECTION FOR REINFORCING BARS (UNLESS OTHERWISE NOTED):
- A. FOOTINGS 3 INCH BOTTOM AND SIDES, 2 INCH TOP
- B. GRADE BEAMS 2 INCH BOTTOM AND SIDES, 1 1/2 INCH TOP (TO STIRRUPS)
- C. PIERS 1 1/2 INCH (TO TIES)
- D. FORMED SLABS 1 1/2 INCH TOP AND BOTTOM E. WALLS AND PADS 2 INCH
- F. EXTERIOR SLABS ON FILL 2 1/2 INCH BOTTOM, 2 INCH TOP
- G. INTERIOR SLABS ON FILL 2 1/2 INCH BOTTOM, 1 1/2 INCH TOP
- 9. ANCHOR BOLTS SHALL BE CARBON STEEL CONFORMING TO ASTM A307 SPECIFICATIONS, WITH HEAVY HEX NUTS AND WASHERS. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED CONFORMING TO ASTM A123 AND A153 SPECIFICATIONS, AND SHALL BE ACCURATELY PLACED USING TEMPLATES.
- 10. NO CONSTRUCTION JOINT SHALL BE MADE UNLESS SHOWN ON DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.
- 11. GROUT IN DRILLED HOLES FOR ANCHOR BOLTS AND REINFORCING STEEL DOWELS, AND UNDER BASE PLATES SHALL BE NON-SHRINK NON-METALLIC "MASTERFLOW 713" OR "MASTERFLOW 928" BY DEGUSSA BUILDING SYSTEMS. MANUFACTURER'S INSTRUCTIONS CONCERNING HOLE SIZE, SURFACE PREPARATION AND INSTALLATION SHALL BE FOLLOWED
- 12. EDGE TOOL TOP HORIZONTAL EDGES OF PIERS, EQUIPMENT (PUMP) PADS. OTHER EXPOSED EDGES SHALL HAVE 3/4 INCH CHAMFER.
- 13. RAMPS, PADS AND SLABS SHALL BE TROWEL FINISHED TO WITHIN 1/8 INCH OF ELEVATIONS SHOWN ON DRAWINGS. FOLLOWING TROWELLING, PROVIDE NON-SLIP MEDIUM BROOM FINISH.
- 14. PROVIDE CORNER BARS TO MATCH HORIZONTAL BARS AT ALL EXTERIOR CORNERS.
- 15. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82 AND A185 SPECIFICATIONS.
- 16. PROVIDE MINIMUM OF 6 INCH MECHANICALLY COMPACTED CRUSHED STONE UNDER SLABS AND WHERE OTHERWISE NOTED ON DRAWINGS.
- 17. JOINT SEALANT SHALL BE ONE-COMPONENT POLYURETHANE "SIKAFLEX-1A" BY SIKA CHEMICAL CORPORATION.
- 18. WATERSTOPS SHALL BE 6 INCH FLAT RIBBED PVC WATERSTOPS R6-316 OR 4 INCH RIBBED CENTER BULB PVC WATERSTOPS RB4-316 BY VINYLEX CORPORATION. WATERSTOPS SHALL BE HEAT FUSED AT ALL JOINTS.
- 19. PERIMETER FOUNDATION WALL RIGID INSULATION SHALL BE STYROFOAM SQUARE EDGE BY DOW CHEMICAL COMPANY; AND LATEX MODIFIED CONCRETE FACING, TONGUE AND GROOVE FORMAT, WITH GALVANIZED CLIPS AND FASTENERS.
- 20. PRIOR TO CASTING CONCRETE PADS AND PIERS, BASE SLAB AND WALL SHALL BE ROUGHENED, CLEANED AND COATED WITH A CONCRETE BONDING AGENT. BONDING AGENT SHALL BE "CONCRESIVE LIQUID (LPL)" OR "CONCRESIVE PASTE (LPL)" BY DEGUSSA BUILDING SYSTEMS. MANUFACTURER'S INSTRUCTIONS CONCERNING SURFACE PREPARATION AND APPLICATION SHALL BE FOLLOWED.

STRUCTURAL STEEL NOTES

- FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO THE DESIGN DRAWINGS, SCOPE OF WORK AND SPECIFICATIONS, AND SHALL BE IN ACCORDANCE WITH THE AISC SPECIFICATIONS.
- 2. LATEST REVISION AND/OR VERSION OF ALL CODES AND REFERENCE STANDARDS SHALL BE FOLLOWED.
- 3. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 SPECIFICATIONS. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B WITH YIELD STRESS OF 46 KSI
- SHALL CONFORM TO ASTM A500 GRADE B WITH YIELD STRESS OF 46 KSI.

 4. ALL DIMENSIONS SHALL BE FIELD CHECKED BEFORE FABRICATION MAY BEGIN.
- 5. WELDING SHALL BE IN ACCORDANCE WITH THE AWS STRUCTURAL WELDING CODE. WELDED CONNECTIONS SHALL BE MADE WITH E70XX ELECTRODES. ROOT PASS AND TACK WELDS SHALL BE MADE WITH E6010 ELECTRODES. FILLET WELDS ON STANDARD FRAMED BEAM CONNECTIONS MAY BE 3/16 INCH MINIMUM. ALL OTHER FILLET WELDS SHALL BE 1/4 INCH
- 6. GUSSET PLATES AND CLIP ANGLES SHALL BE 5/16 INCH THICK MINIMUM (UNLESS OTHER-WISE NOTED). GENERALLY, ONE-SIDED CONNECTIONS FOR BEAMS SHALL NOT BE USED.
- 7. SHOP CONNECTIONS MAY BE EITHER WELDED OR BOLTED. FIELD CONNECTIONS SHALL BE BOLTED (UNLESS OTHERWISE NOTED). CONNECTIONS FOR NEW STEEL FRAMING TO EXISTING STEEL SHALL HAVE ONE END OF MEMBER BOLTED TO ALLOW FOR ADJUSTMENTS. WELDED CONNECTIONS, FIELD AND SHOP, SHALL BE CONTINUOUS FULL PENETRATION SEAL WELDS.
- 8. FASTENERS SHALL BE HIGH STRENGTH ASTM A325-N, 3/4 INCH DIAMETER GALVANIZED BOLTS WITH ASTM A194 GRADE 2H OR A563 GRADE DH NUTS TAPPED OVERSIZE AFTER GALVANIZING AND THREADS LUBRICATED. HARDENED WASHERS SHALL BE PROVIDED UNDER ROTATING PART OF NUT AND BOLT ASSEMBLY. CONNECTIONS NOTED WITH A325-SC BOLTS SHALL BE SLIP CRITICAL PER AISC SPECIFICATIONS.
- 9. BOLT HOLES SHALL NOT BE LARGER THAN 1/16 INCH PLUS DIAMETER OF THE BOLT. A MINIMUM OF TWO BOLTS PER CONNECTION SHALL BE REQUIRED.
- 10. WHERE BRACING FORCES ARE NOT GIVEN, DESIGN CONNECTIONS AT EACH END FOR 50% OF MEMBER CAPACITY IN TENSION.
- 11. ALL STRUCTURAL STEEL FRAMES INCLUDING GIRTS, PURLINS, MISCELLANEOUS STEEL; DOOR/ WINDOW/OPENING FRAMES, DOORS, COMBINATION LOUVER/DAMPER AND SHUTTERS SHALL BE PAINTED
- 12. PAINT SHALL CONSIST OF ONE COAT PRIMER (6 MILS DFT) EPOXY BAR-RUST 235 AND ONE COAT FINISH (2 MILS DFT) ALIPHATIC URETHANE DEVTHANE 379 BY ICI DULUX-DEVOE COATINGS.

FOUNDATION NOTES

- 1. FOUNDATION DESIGN IS BASED UPON A NET ALLOWABLE SOIL BEARING CAPACITY OF 3,000 POUNDS PER SQUARE FOOT FOR FOOTINGS BEARING ON APPROVED NATIVE SUBGRADE SOILS OR COMPACT STRUCTURAL GRANULAR FILL.
- 2. CONTRACTOR SHALL FIELD VERIFY THE FOUNDATION BEARING GRADE MATERIAL AND BEARING CAPACITY DURING CONSTRUCTION. FOUNDATIONS SHALL BE PLACED ON APPROVED BEARING
- 3. NO FOOTING SHALL BEAR ON EXISTING FILL, SOFT/LOOSE, ORGANIC OR OTHER UNSUITABLE SOILS. IF ENCOUNTERED, THE EXISTING FILL AND UNSUITABLE SOILS AT THE FOOTING BEARING GRADE LEVEL SHALL BE REMOVED DOWN TO COMPETENT NATIVE SUBGRADE AND EXCAVATION BACKFILLED WITH COMPACTED STRUCTURAL GRANULAR FILL IN ACCORDANCE WITH THE SPECIFICATION.
- 4. EXISTING UNDERGROUND PIPING, REINFORCED CONCRETE STRUCTURES, UTILITIES, ELECTRICAL CABLES AND GROUNDING SYSTEMS NOT IDENTIFIED ON THE DRAWINGS MAY EXIST. WHEN UNCOVERED, THE CONTRACTOR MUST REPORT FINDINGS TO THE ENGINEER FOR IDENTIFICATION AND RECOMMENDED ACTION.
- 5. BACKFILL AROUND PIPES AND CABLES AS PER SPECIFICATIONS. NO PIPES OR CONDUITS SHALL BE PLACED IN FOOTINGS.
- 6. WHERE PIPES OR CONDUITS RUN PERPENDICULAR TO A FOOTING, STEP THE TOP OF THE FOOTING DOWN TO ALLOW PIPES OR CONDUITS TO RUN OVER TOP OF THE FOOTING. WHERE PIPES OR CONDUITS RUN PARALLEL TO A FOOTING, STEP BOTTOM OF FOOTING DOWN SO THAT A LINE DRAWN BETWEEN THE INVERT OF PIPE OR CONDUIT AND BOTTOM OF FOOTING SHALL NOT EXCEED 30 DEGREES ABOVE THE HORIZONTAL. NO PIPING OR CONDUIT SHALL BE ALLOWED TO PASS WITHIN A 30-DEGREE PLANE OF INFLUENCE BELOW AND AWAY FROM FOOTINGS.
- 7. MAXIMUM WALL FOOTING STEP SHALL BE 1'-0" VERTICAL SPACED NOT LESS THAN 2'-0" ON CENTER.
- 8. BUILDING FOUNDATIONS OVER EXISTING UTILITY LINES SHALL BEAR ONLY ON COMPACTED STRUCTURAL FILL PLACED AFTER REMOVAL OF ALL UNCONTROLLED FILL AND UNSUITABLE

ARCHITECTURAL NOTES

- BUILDING SHALL CONSIST OF PRE-ENGINEERED METAL, CLEAR SINGLE SPAN RIGID FRAME WITH STRAIGHT COLUMNS (NON-TAPERED) AND GABLED ROOF BEAMS.
- 2. ROOF SHALL HAVE A 2:12 PITCH.
- 3. ROOF PANELS SHALL BE 24 GAUGE STANDING SEAM STEEL.
- 4. EXTERIOR WALL PANELS SHALL BE 26 GAUGE.
- 5. INTERIOR WALL LINER PANELS SHALL BE 28 GAUGE (STANDARD HEIGHT 8'-3").
- 6. BOTTOM OF STEEL BASE PLATE TO BE AT EL. 100'-7".
- 7. BUILDING SHALL HAVE A 6" HIGH CURB AND 1" GROUT UNDER STEEL BASE PLATES.

11. BASED ON USE, BUILDING IS NOT INTENDED TO BE "ACCESSIBLE" PER CODE.

- 8. CUTOUTS AND HOLES IN WALL AND ROOF PANELS SHALL BE COMPLETELY SEALED BY MECHANICAL/ELECTRICAL CONTRACTORS WITH FIRE STOP AND WEATHER PROOF MATERIALS AFTER PIPE/DUCT/CABLE INSTALLATIONS.
- 9. PAINT FOR CONTROL ROOM GYPSUM BOARD WALL SHALL CONSIST OF ONE COAT PRIMER (1 MIL DFT) ULTRA-HIDE PVA (1030) AND ONE COAT FINISH (2 MILS DFT) ULTRA-HIDE LATEX ENAMEL (1416) BY ICI PAINT STORES.
- 10. FIRE EXTINGUISHERS: CONTROL ROOM - (2 NOS) CLASS C TYPE,
- OTHER AREAS (1 NO) CLASS ABC TYPE.

PRECAST CONCRETE NOTES

- 1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGHT OF 5,000 PSI AT 28 DAYS.
- 2. AIR ENTRAINED CONCRETE:
- A. CONCRETE SHALL BE AIR ENTRAINED
- B. CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II WITH AIR ENTRAINING ADMIXTURE CONFORMING TO ASTM C260. AIR CONTENT (% BY VOLUME) SHALL NOT BE LESS THAN 5% NOR GREATER THAN 7%.
- 3. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.
- 4. LAP SPLICES IN REINFORCING SHALL BE IN ACCORDANCE WITH ACI 318 SPECIFICATIONS. LAP SPLICES SHALL NOT BE LESS THAN 18 INCHES.
- 5. CONCRETE PROTECTION FOR REINFORCING BARS SHALL BE INDUSTRY OR DOT STANDARDS, UNLESS NOTED OTHERWISE.
- 6. DESIGN LOADING TO MEET AASHTO HS-20-44 WITH 30% IMPACT. FOR HYDROSTATIC PRESSURE
- AND UPLIFT FORCES, WATER TABLE SHALL BE CONSIDERED AT THE GROUND SURFACE.
- 7. LIFTING HOLES IN PRECAST UNITS TO BE FILLED WITH CONCRETE REPAIR MATERIAL IN ACCORDANCE WITH NYSDOT 701-04 SPECIFICATION.

PERMIT NOTE

CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM CITY AND STATE AGENCIES FOR UTILITIES AND ROAD PAVEMENT INCLUDING RIGH-OF-WAY WORK.

AS BUILT RECORD DRAWING

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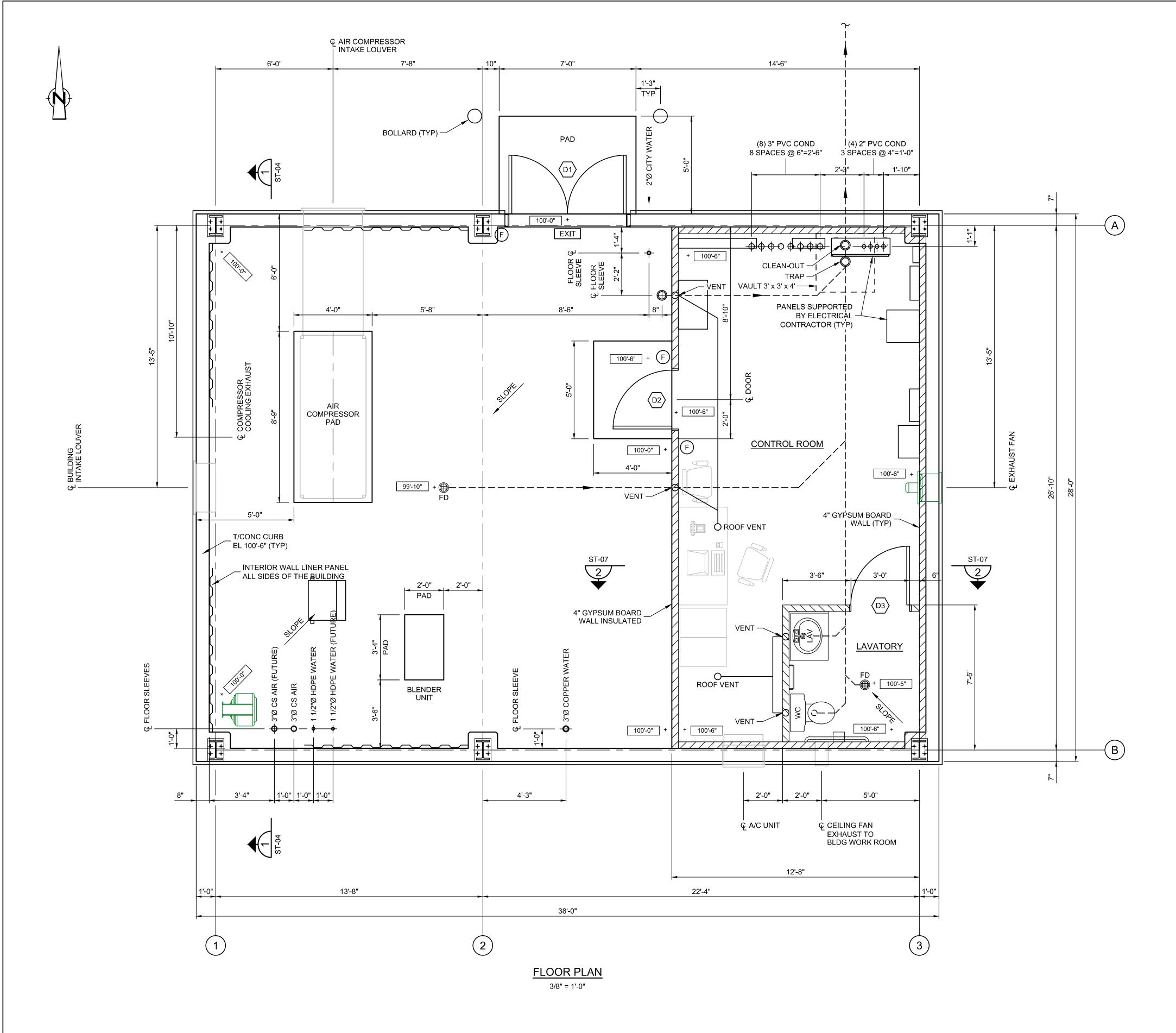
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING GENERAL NOTES



06883-00(056)ST-BU001 AUG 22/2012



BUILDING CODE DATA

CODE:
LOCATION:
BUILDING DIMENSIONS:
BUILDING HEIGHT:
BUILDING AREA:
OCCUPANCY CLASS:
CONSTRUCTION:
OCCUPANT LOAD:
BUILDING TYPE:
BUILDING INSULATION:
FIRE SEPARATION DISTANCE:
FIRE RESISTANCE RATING:

BUILDING CODE OF NEW YORK STATE

TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK

28'-0" x 38'-0" ONE STORY

14'-6" NOMINAL EAVE - ABOVE FLOOR

1,064 SQUARE FEET (TABLE 503)

USE GROUP F-2 FACTORY INDUSTRIAL (SECTION 306.3)

NON-COMBUSTIBLE TYPE 2B (SECTION 602.2, TABLE 601)

ACTUAL - NONE; TABLE - 10 PERSONS (SECTION 1003.2.2.2)

PRE-ENGINEERED METAL, STRUCTURAL STEEL RIGID FRAMED

WALLS - R19, ROOF - R30

GREATER THAN 30 FEET

EXTERIOR WALL - 0 HR (TABLES 601 & 602)

NOT REQUIRED (TABLE 302.3.3)

STRUCTURAL LOADS (NON-FACTORED)

DEAD LOAD
 FLOOR LIVE LOAD

UNIFORMLY DISTRIBUTED LOAD
CONCENTRATED LOAD

FIRE SEPARATION ASSEMBLIES:

3. ROOF LIVE LOAD

0 - 200 SQUARE FEET TRIBUTARY AREA 201 - 600 SQUARE FEET TRIBUTARY AREA OVER 600 SQUARE FEET TRIBUTARY AREA CONCENTRATED LOAD

4. ROOF SNOW LOAD

GROUND SNOW LOAD
SNOW EXPOSURE FACTOR
SNOW LOAD IMPORTANCE FACTOR

5. WIND LOAD

BASIC WIND SPEED (3-SECOND GUST)
EXPOSURE CATEGORY
WIND LOAD IMPORTANCE FACTOR

6. EARTHQUAKE LOAD

SEISMIC USE GROUP SEISMIC IMPORTANCE FACTOR SITE CLASS

7. SPECIAL LOADS

COLLATERAL IMPOSED CEILING LOAD
PIPE/CABLE & EQUIPMENT LOADS
FLOOD LOAD

UNIT HEATER AIR CONDITIONER

8. <u>DEFLECTION LIMITATION</u>

EXTERIOR WALL AND POOF SYSTEM

EXTERIOR WALL AND ROOF SYSTEMS

 FOUNDATION
 NET ALLOWABLE SOIL BEARING P

NET ALLOWABLE SOIL BEARING PRESSURE MODULUS OF SUBGRADE REACTION

STRUCTURAL, NONSTRUCTURAL, EQUIPMENT, PIPE, CABLE

125 POUNDS PER SQUARE FOOT

2,000 POUNDS (ON 2 1/2 FT x 2 1/2 FT SQUARE AREA)

20 POUNDS PER SQUARE FOOT
16 POUNDS PER SQUARE FOOT
12 POUNDS PER SQUARE FOOT
200 POUNDS (ON AREA OF ONE SQUARE INCH)

45 POUNDS PER SQUARE FOOT (FIGURE 1608.2)

0.9 (TABLE 1608.3.1) 1.0 (SECTION 1604.5)

120 MILES PER HOUR (FIGURE 1609) C (SECTION 1609.4)

GROUP I (SECTION 1616.2) 1.0 (SECTION 1604.5)

1.0 (SECTION 1604.5)

D (SECTION 1615.1.1)

10 POUNDS PER SQUARE FOOT REFER DRAWINGS NONE 250 POUNDS EACH 500 POUNDS

NOT TO EXCEED 1/240 OF SPAN OF STRUCTURAL MEMBER

3,000 POUNDS PER SQUARE FOOT 200 KIPS PER CUBIC FOOT

<u>LEGEND</u>

+ 100'-0" ELEVATION FEET AMSL

EXIT EXIT SIGN INSTALLED ABOVE DOOR

F FIRE EXTINGUISHER

(F) FIRE EXTINGUISHER
(D1) DOOR

DIRECTION OF FLOOR SLOPE

UNIT HEATER

WALL INTERIOR PANEL

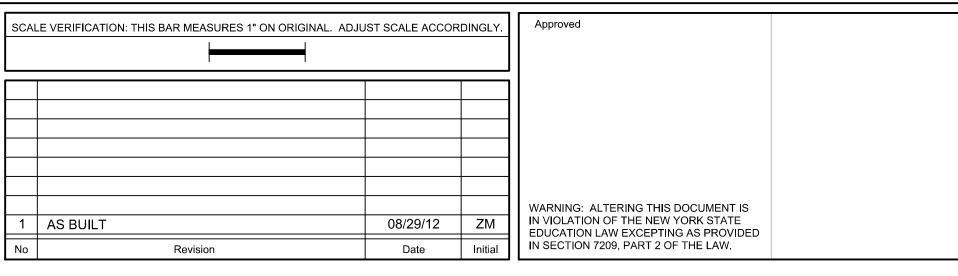
GYPSUM BOARD WALL (FIRE-RATED)

● FD FLOOR DRAIN

AS BUILT
RECORD DRAWING

NOTES

- 1. ELECTRICAL CONTRACTOR SHALL INSTALL CONDUITS IN CONTROL ROOM FLOOR SLAB AREA PRIOR TO SLAB CONSTRUCTION.
- 2. CONTRACTOR SHALL INSTALL FLOOR SLEEVES FOR PIPING PRIOR TO SLAB CONSTRUCTION.
- 3. REFER MECHANICAL DRAWINGS FOR PLUMBING.
- 4. FLOOR DRAIN SHALL BE FD-2330-PV3 HEAVY DUTY WITH SEDIMENT BASKET BY ZURN (TEL. (716) 665-1131, WWW.ZURN.COM).



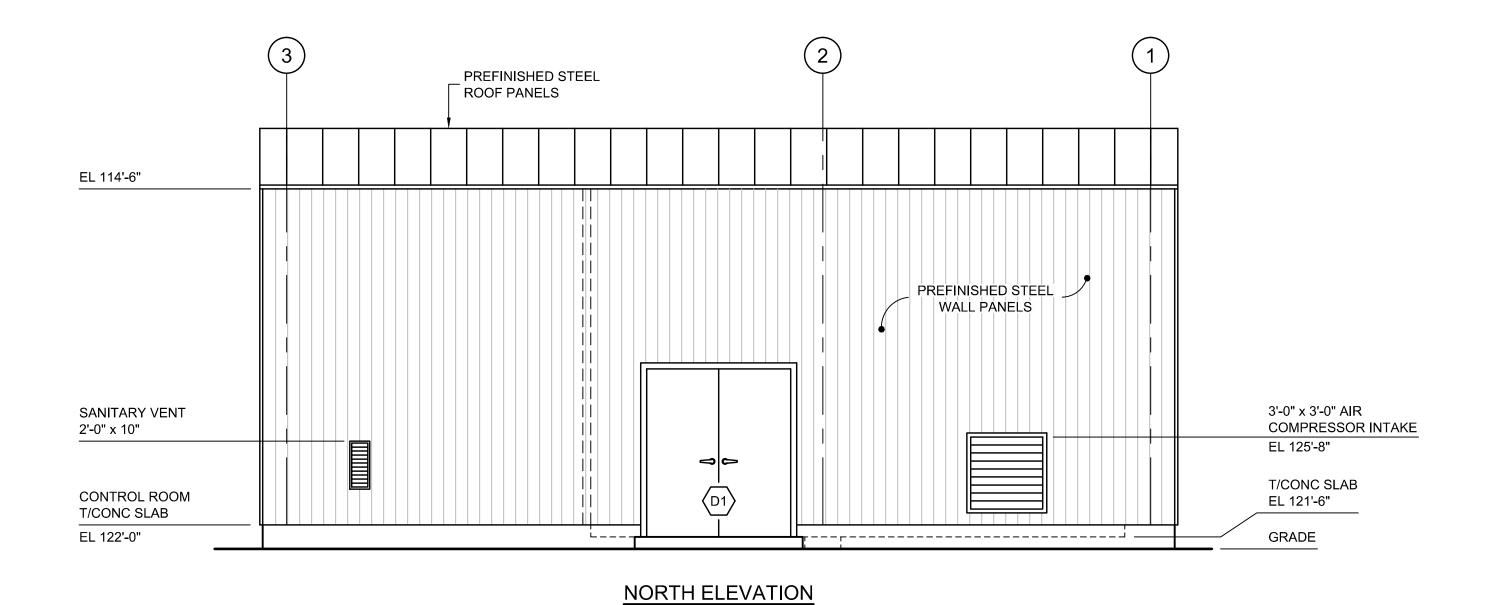
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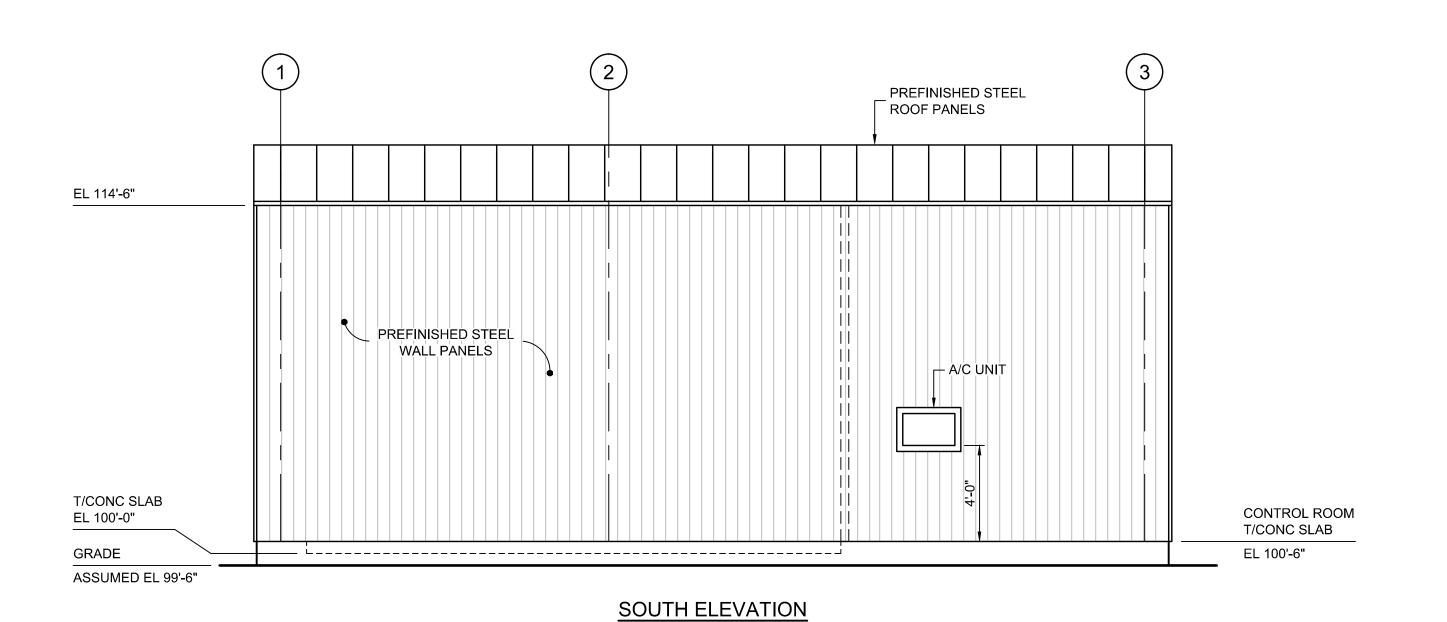
BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING FLOOR PLAN

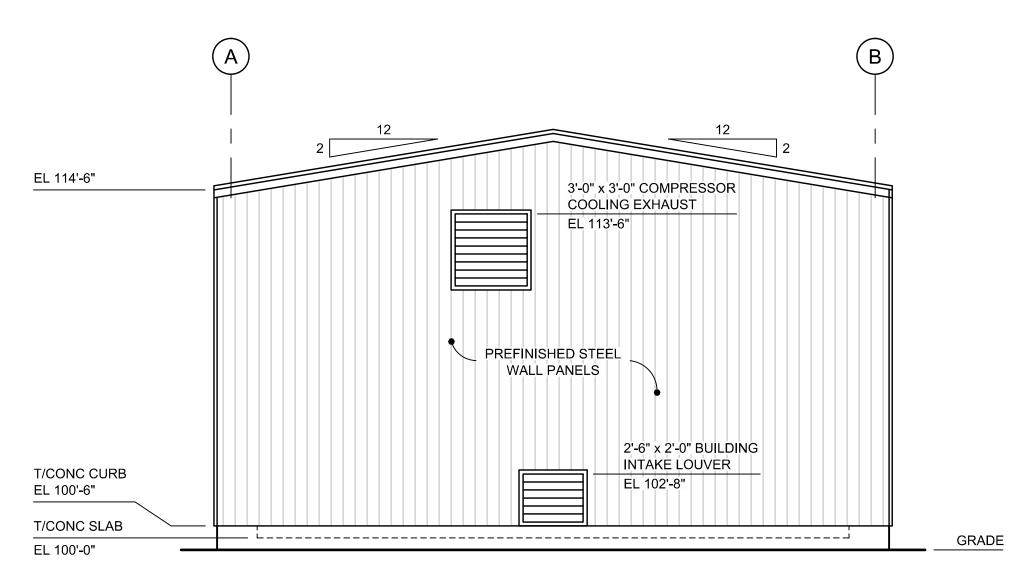


ł	Source Reference:			Date:	
				AUGUST 2012	
	Project Manager:	Reviewed By:	Designed By:	Drawn By:	
	JK	JGRW	SKM	ZM	
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	3/8"=1'-0"	06883-00	056	ST-02	

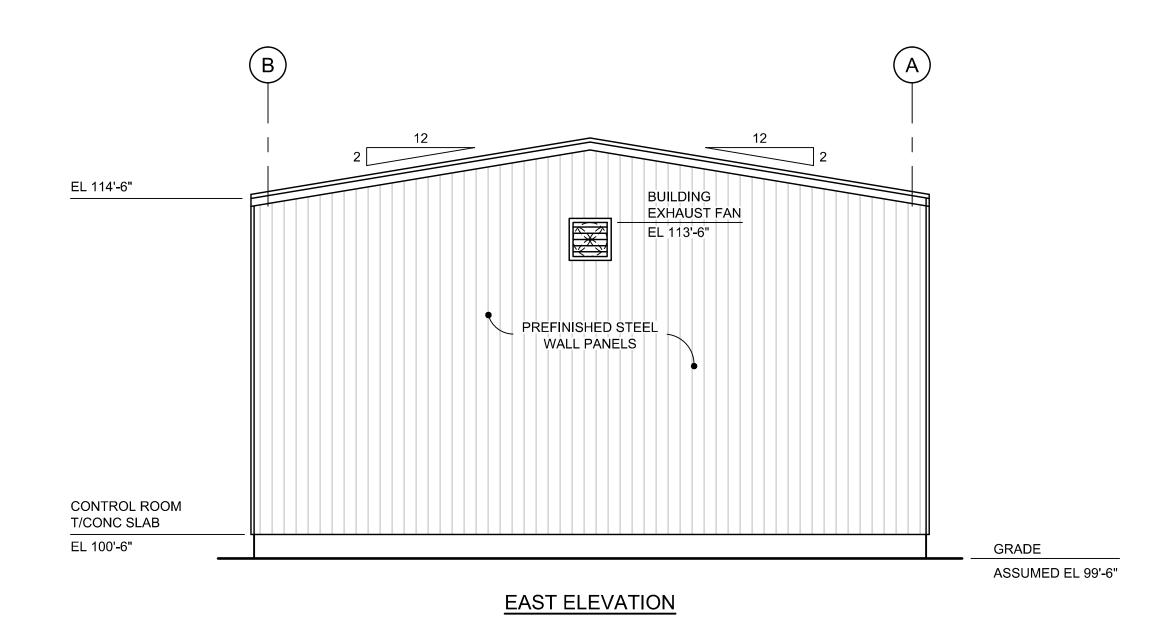




CONTRACTOR SHALL PROVIDE BUILDING EXTERIOR ELEVATION OF 114'-6" AND INTERIOR CLEARANCE AT PRIMARY RIGID FRAME OF MINIMUM 12'-8" ABOVE FLOOR SLAB EL 100'-0", WHICHEVER RESULTS IN GREATER BUILDING HEIGHT

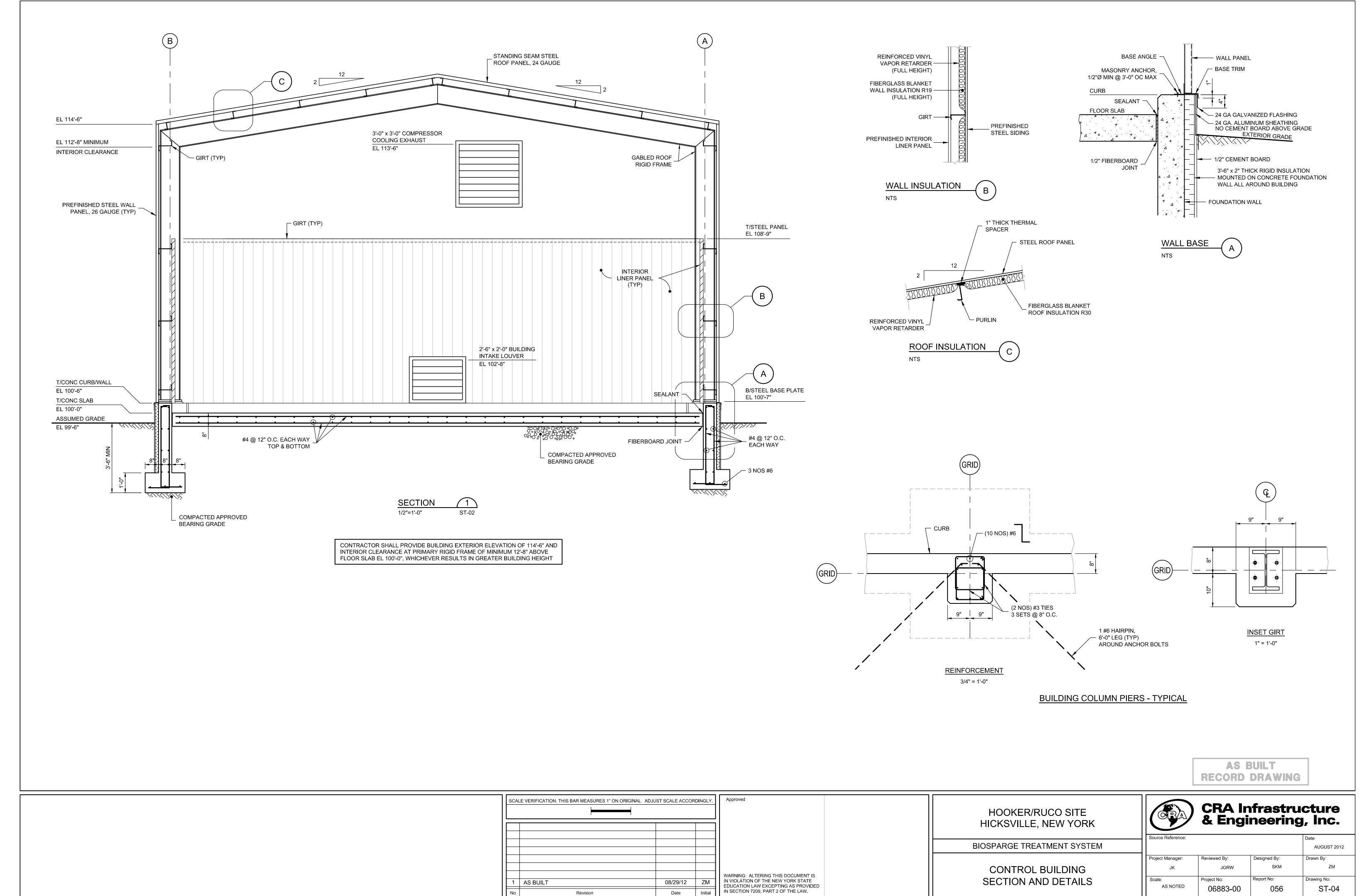


WEST ELEVATION

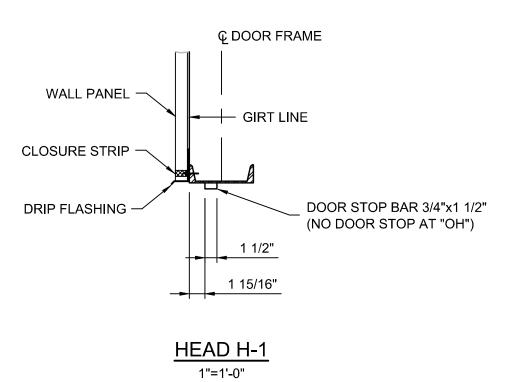


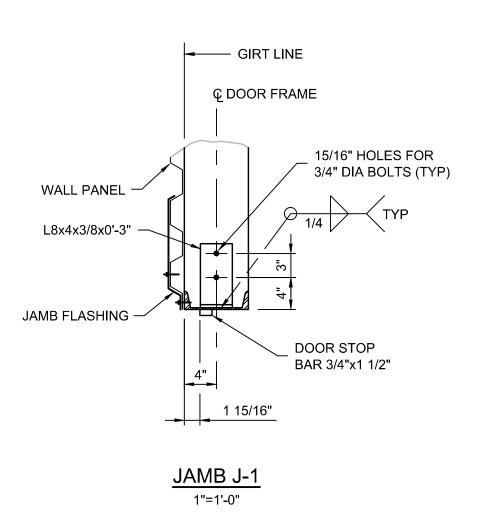
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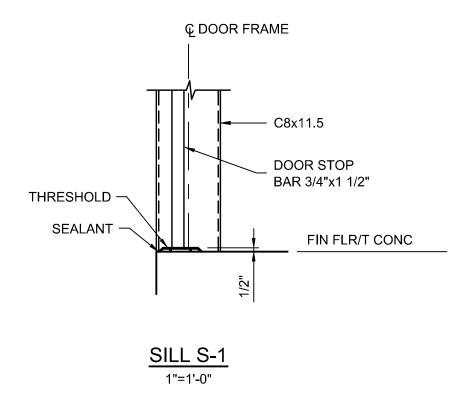
SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY. CRA Infrastructure & Engineering, Inc. HOOKER/RUCO SITE HICKSVILLE, NEW YORK Source Reference: BIOSPARGE TREATMENT SYSTEM AUGUST 2012 Project Manager: Designed By: Drawn By: SKM ZM CONTROL BUILDING JGRW WARNING: ALTERING THIS DOCUMENT IS
IN VIOLATION OF THE NEW YORK STATE
EDUCATION LAW EXCEPTING AS PROVIDED
IN SECTION 7209, PART 2 OF THE LAW. **ELEVATIONS** Drawing No: AS BUILT 1/4"-1'-0" 06883-00 ST-03 Date Revision



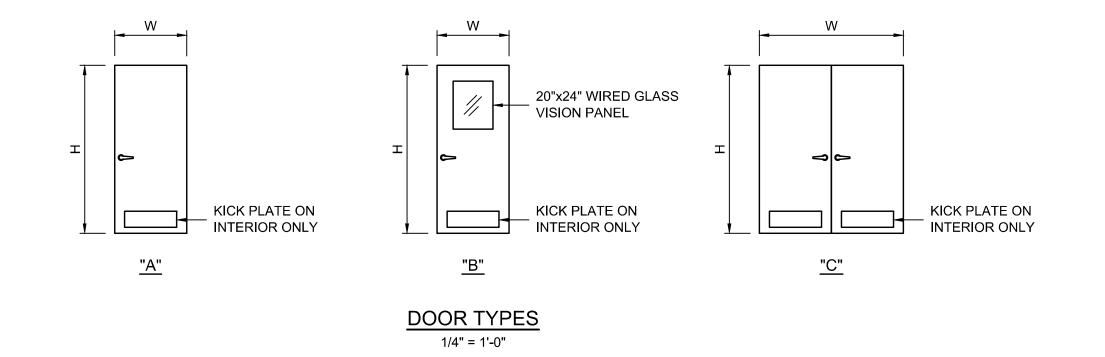
06883-00(056)ST-BU004 AUG 22/2012







DOOR & HARDWARE SCHEDULE ABBREVIATIONS: INTERIOR INTERIOR SFT 1/4" SAFETY GLASS - STEEL WIRED EN ALUMINUM ENAMEL SS STAINLESS STEEL FRP FIBERGLASS REINFORCED PLASTIC LEFT HAND REVERSE BEVEL REVERSE BEVEL GHM GALVANIZED HOLLOW METAL STL STRUCTURAL STEEL LEFT HAND RBR RUBBER EXTERIOR EXTERIOR DOOR FRAME HARDWARE DOOR OPENING REMARKS LHRB DOOR - DEAD BOLT T & B, 7'-0" STL "C" R14.97 6'-0" 1 3/4" GHM H-1 J-1 LHRB RHRB DOOR - LATCHES & EXIT DEVICE GHM SFT STL "B" RHRB 3/4 HR R2.44 3'-0" 7'-0" 1 3/4" D3 "A" RHRB 3'-0" 7'-0" 1 3/4" GHM STL INTERIOR LATCH



DOOR AND HARDWARE NOTE

ALL DOORS AND HARDWARE SHALL BE AS SPECIFIED OR APPROVED EQUAL, AND SHALL CONFORM TO CODE REQUIREMENTS FOR ACCESSIBILITY.

<u>DOORS</u>

- 1. EXTERIOR DOORS SHALL BE "IMPERIAL" BY CECO DOOR PRODUCTS, 16 GAUGE, POLYURETHANE CORE, GALVANIZED AND PAINTED.
- 2. INTERIOR DOORS SHALL BE "REGENT" BY CECO DOOR PRODUCTS, 18 GAUGE, HONEYCOMB CORE, GALVANIZED AND PAINTED.

HARDWARE (MANUFACTURER'S STANDARD)

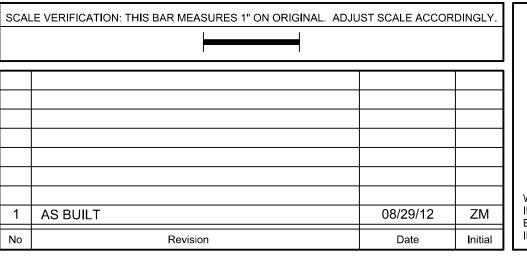
- 1. CLOSER: 1250 SERIES ALUMINUM ENAMEL (EN) "SARGENT".
- 2. DOOR STOP: TRI BASE FLOOR STOP #259F-US26D "HAGER".
- 3. HINGES: FULL MORTISE STAINLESS STEEL 32D, 4 1/2"x4 1/2"x0.134 GAUGE, #BB1191 "HAGER".
 4. KICK PLATE: STAINLESS STEEL 32D, 16 GAUGE, 8"x26", #220S "HAGER".
- 5. PANIC SET:
 - A. EXIT DEVICE: #12-9913-ETF, US 32D FIRE RATED "SARGENT"; EXTERIOR DOOR BY BUTLER.
 - B. PUSH PLATE: STAINLESS STEEL 32D, 3"x12", #30S "HAGER".C. PULL PLATE: STAINLESS STEEL 32D, 3"x12", #32G "HAGER".
- D. LOCKS: MORTISE "SARGENT".6. THRESHOLD:
- A. SKID RESISTANT ABRASIVE CAST ALUMINUM HEAVY DUTY, 4" WIDE, #624S "HAGER".
- B. NON-SLIP ABRASIVE ALUMINUM SADDLE, 4" WIDE, #410S "HAGER".7. WEATHERSTRIP AND DOOR BOTTOM:
- A. WEATHERSTRIP AND DOOR BOTTOM:

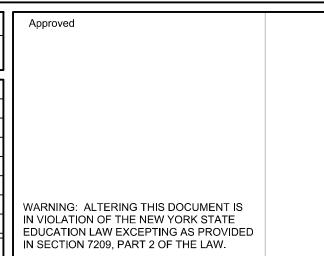
 A. WEATHERSTRIP JAMB & HEAD #870S-N "HAGER".

B. DOOR BOTTOM #774S-V - "HAGER".

AS BUILT

RECORD DRAWING





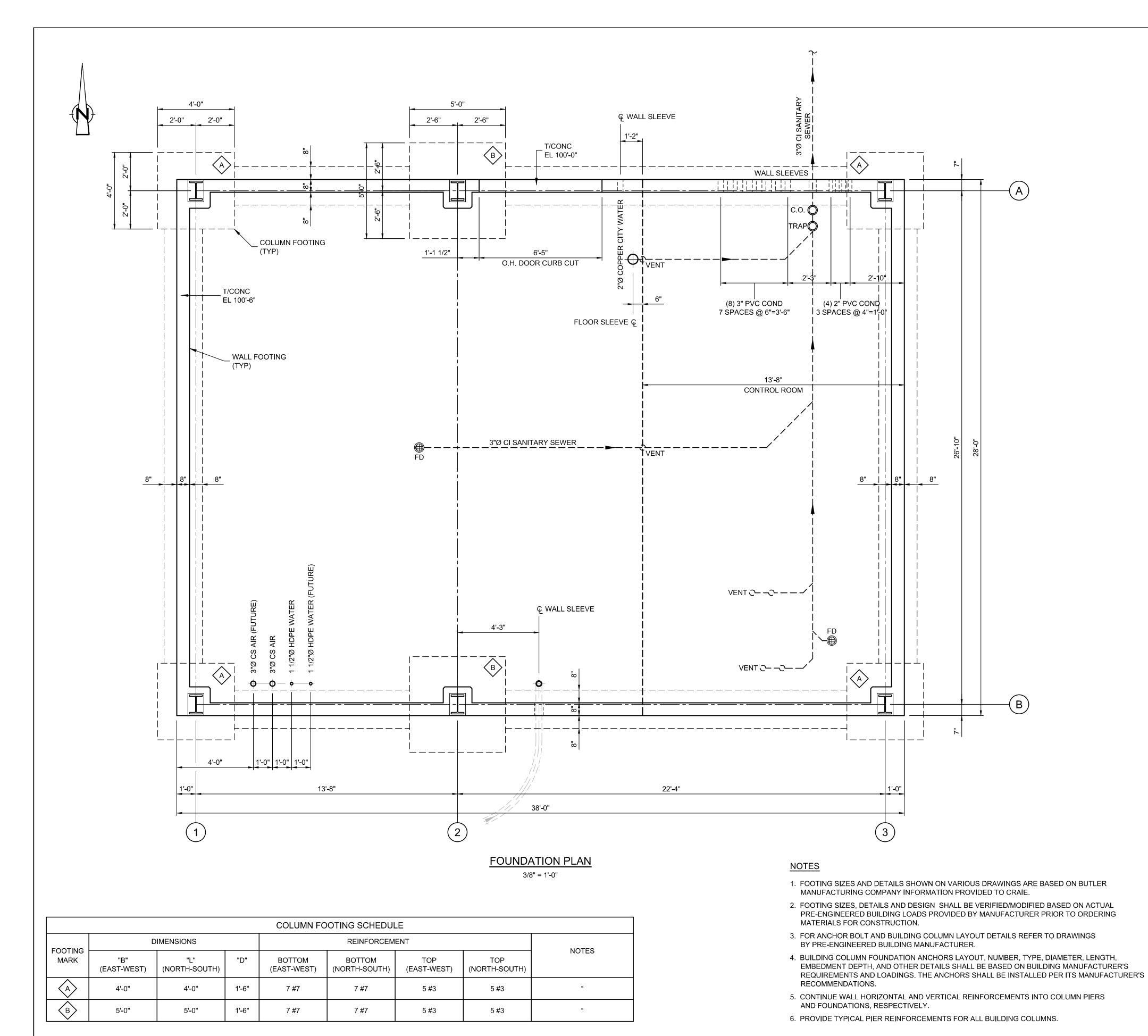
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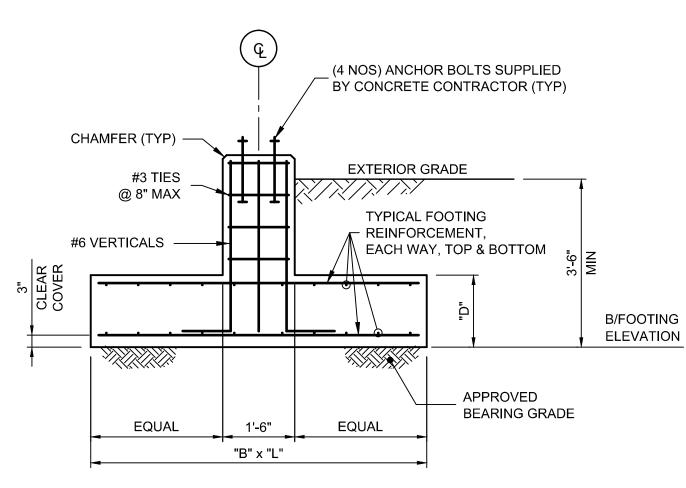
BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING SCHEDULE & DETAILS

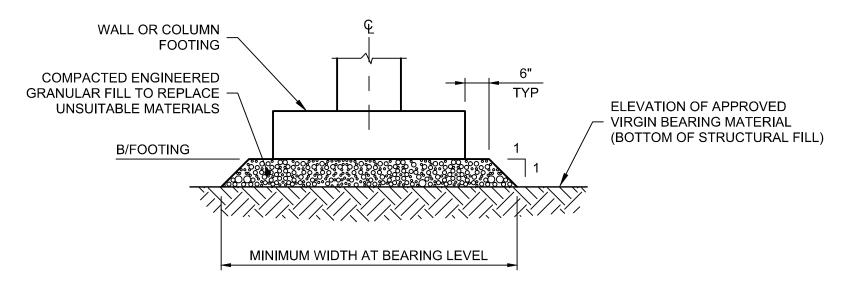


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			AUGUST 2012
oject Manager:	Reviewed By:	Designed By:	Drawn By:
JK	JGRW	SKM	ZM
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AS NOTED	06883-00	056	ST-05

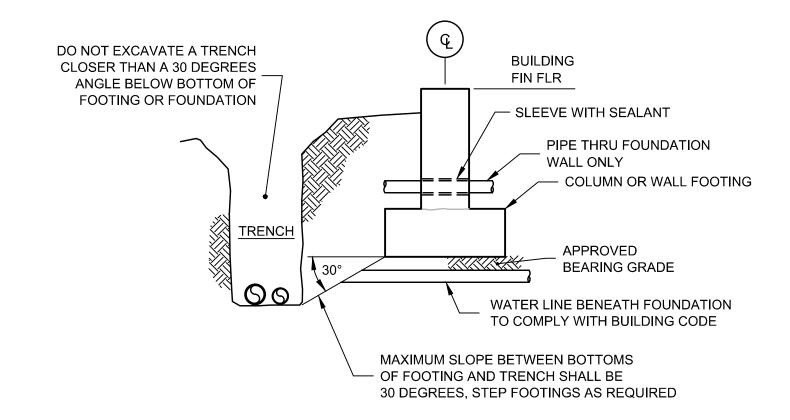




COLUMN FOOTING DETAIL NTS



FILL BENEATH FOUNDATION NTS



TRENCH NEAR FOOTING
NTS

AS BUILT RECORD DRAWING

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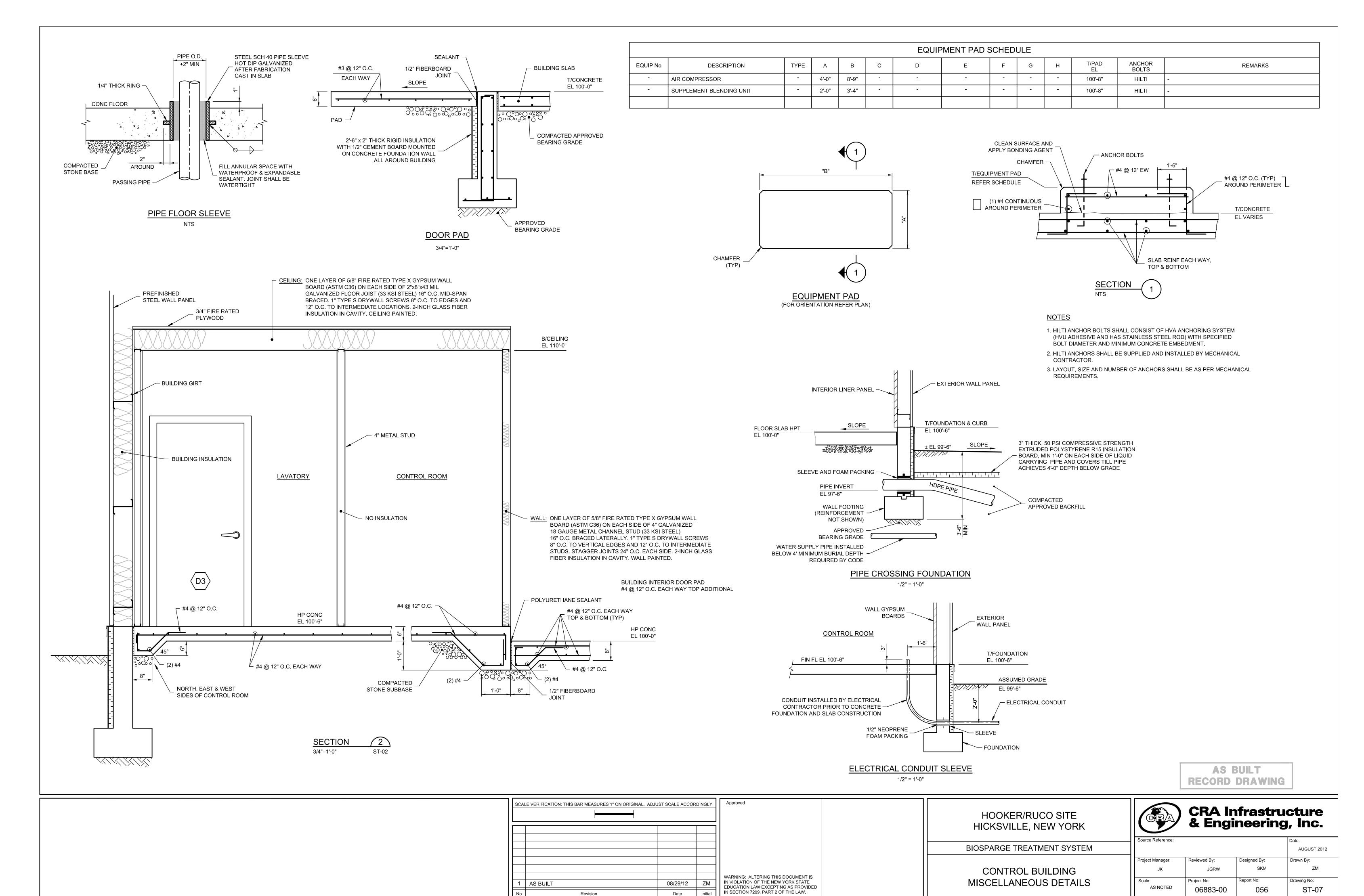
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BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING FOUNDATION PLAN

CRA Infrastructure & Engineering, Inc.

ł	Source Reference:			Date:
1				AUGUST 2012
	Project Manager:	Reviewed By:	Designed By:	Drawn By:
	JK	JGRW	SKM	ZM
l	Scale:	Project No:	Report No:	Drawing No:
	3/8" = 1'-0"	06883-00	056	ST-06



	FRUMENT LINES		INTERLOCK LOGIC IN CONTROLLER OR PLC WHERE - 1,2,3IS OPTIONAL REFERENCE TO INTERLOCK DETAIL DESCRIPTION	V P	CONSERVATION VENT		-	TYPICAL ISA LE	TTER COMBIN	NATIONS				
—	MAIN PROCESS LINE SECONDARY PROCESS LINE UNDEFINED SIGNAL	PLCx	- x = PLC No. WHEN MORE THAN ONE PLC IS PRESENT IN THE SYSTEM		FLAME ARRESTOR		Controllers Self- Actuated	Readout Devices	Switches and Alarm Devices *	Transmitters	Solenoids, Relays,		Well Viewing	a
	PNEUMATIC SIGNAL	MISCELLANEO	OUS SYMBOLS	(XF)	FLAME ARRESTOR	First- Letters Initiating or Measured Variable	Control Recording Indicating Blind Valves	Recording Indicating	High ** Low Con	mb Recording Indicating	g Blind Computing Primary Devices Elemen	· 1	or Device, Probe Glass	·
 ← X	ELECTRICAL SIGNAL CAPILLARY TUBE, FILLED SYSTEM	\rightarrow	REDUCER			A Analysis	ARC AIC AC	AR AI	ASH ASL AS	SHL ART AIT	AT AY AE	E AP	AW	
	ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)	1	FLEXIBLE PIPE EXPANSION JOINT	PRIMARY ELEN	MENT SYMBOLS	B Burner/Combustion	BRC BIC BC	BR BI	BSH BSL BS	SHL BRT BIT	BT BY BE	<u> </u>	BW BG	
\sim	ELECTROMAGNETIC OR SONIC SIGNAL		BLIND FLANGE			C User's Choice D User's Choice								
o—o—o—	(NOT GUIDED) INTERNAL SYSTEM LINK	— :"	HOSE CONNECTION	(FI)	VARIABLE AREA FLOWMETER	E Voltage	ERC EIC EC	ER EI	ESH ESL ES	SHL ERT EIT	ET EY EE			
L	HYDRAULIC SIGNAL	—] 	SCREWED CAP, CLEANOUT Y-LINE STRAINER	PI		F Flow Rate FQ Flow Quantity	FRC FIC FC FCV FQRC FQIC	/	FSH FSL FS FQSH FQSL	SHL FRT FIT FQIT	FT FY FE FQT FQY FQE		FG	
• 	MECHANICAL LINK ELECTRICAL BINARY SIGNAL	**	T LINE OTTVAINER			FF Flow Ratio	FFRC FFIC FFC		FFSH FFSL	1 311	FE FE			
TO / FROM			SPECIFICATION CHANGE	*	DIAPHRAM SEAL WITH PRESSURE	G User's Choice								
SHEET No.	OFF PAGE CONNECTOR	Y	FUNNEL DRAIN		LEAD LINE	H Hand I Current	HIC HC	IR II	HS ISH ISL ISH		IT IY IE			
• 2	HARDWIRED INTERLOCK LOGIC		STATIC MIXER	PI		J Power	JRC JIC	JR JI	JSH JSL JSI		JT JY JE			
$\langle 1 \rangle^2$	(-1,2,3IS OPTIONAL REFERENCE TO INTERLOCK DETAIL DESCRIPTION)	TPH	FILTER/REGULATOR/LUBRICATOR			K Time L Level	KRC KIC KC KCV		KSH KSL KS LSH LSL LS		KT KY KE		LW LG	
/ALVE SYMBOL	·	NU 020	ANNUNCIATOR HORN	*	DIAPHRAM SEAL (LINE-MOUNTED)	M User's Choice	LINO LIO LO LOV							
BA- "			FILTER/REGULATOR			N User's Choice								
⊠ BU- "	BALL VALVE	Ū		(TE)	TEMPERATURE ELEMENT WITH THERMOWELL	O User's Choice P Pressure/Vacuum	PRC PIC PC PCV	PR PI	PSH PSL PS	SHL PRT PIT	PT PY PE	E PP		 BSY
\bowtie	BUTTERFLY VALVE	X"	EQUIPMENT INSULATED WITH X" OF INSULATION	RTD	(OPTIONAL ELEMENT DESCRIPTION RTD, TYPE K)	PD Pressure, Differential	PDRC PDIC PDC PDC		PDSH PDSL	PDRT PDIT		E PP		PSE
CH-"	CHECK VALVE	Ŋ				Q Quantity R Radiation	QRC QIC RRC RIC RC		QSH QSL QS RSH RSL RS		QT QY QE RT RY RE		RW	
GA- "	GATE VALVE	⟨R⟩	RESET FOR LATCH-TYPE ACTUATOR	—(FG)—	FLOW SIGHT GLASS (LG - LEVEL SIGHT GLASS, SG - GENERAL SIGHT GLASS)	S Speed/Frequency	SRC SIC SC SCV		SSH SSL SS		ST SY SE			
GL- "	GLOBE VALVE	VENT		Ţ		T Temperature	TRC TIC TC TCV		TSH TSL TS		TT TY TE		TW TW	TSE
A B	THREE WAY VALVE	†	OPEN VENT TO ATMOSPHERE		LEVEL DEVICE, FLOAT TYPE	TD Temperature, Differential U Multivariable	TDRC TDIC TDC TDC	V TDR TDI UR UI	TDSH TDSL	TDRT TDIT	TDT TDY TE		IVV	
1c	(FAIL OPEN TO PATH A-C)		INLINE BLANK	ACTUATOR SY	MBOLS	V Vibration/Machinery Analysi		VR VI	VSH VSL VS	SHL VRT VIT	VT VY VE			
A B	FOUR WAY VALVE		RESTRICTION ORIFICE	*		W Weight/Force WD Weight/Force, Differential	WRC WIC WC WC		WSH WSL WS WDSH WDSL	SHL WRT WIT WDRT WDIT	WT WY WE			
c T _D	(FAIL OPEN TO PATH A-C AND B-D)	abla	AIR EJECTOR		DIA DI IDAM A OTILIA TOD	X Unclassified	WERG WEIG WEG WEG	WERK WEI	VVDGIT VVDGE	WEIGH WEIGH	WBT WBT WE			
	DAMPED OD LOUVED	\triangle		₩ # 	DIAPHRAM ACTUATOR	Y Event/State/Presence	YIC YC		YSH YSL		YT YY YE			
	DAMPER OR LOUVER	\sim			CYLINDER ACTUATOR	Z Position/Dimension ZD Gauging/Deviation	ZRC ZIC ZC ZCV ZDRC ZDIC ZDC ZDC		ZSH ZSL ZS ZDSH ZDSL	SHL ZRT ZIT ZDRT ZDIT	ZT ZY ZE ZDT ZDY ZDE			
I		<u> </u>	TRAP	M		Note: This table is not all-inclusive.		her Possible Combinations:						
GENERAL INS	TRUMENT SYMBOLS	*	PULSATION DAMPER		ROTARY MOTOR ACTUATOR	* A, alarm, the annunciating device, may be used in the fashion as S, switch, the actuating device.	ne same	(Restriction Orifice)		evel Light High)	KQI (Running Time Indicator		HMS (Hand Moment	
	LOCALLY MOUNTED INSTRUMENTS			×		** The letters H and L may be omitted in the undefined		K, HIK (Control Stations)	LCH (Le	evel Control High)		LC	CL (Level Control	(Low)
		BB	BLOCK & BLEED ASSEMBLY	- S					IDEN!	TIELO A TIONI I E				
$\overline{()}$	PRIMARY PANEL MOUNTED INSTRUMENTS		DECON & DELED MODELINDET	×	SOLENOID ACTUATOR				IDEN	TIFICATION LE	.IIEKS			
	AUXILARY PANEL MOUNTED INSTRUMENTS	TP 1	TIE POINT TO EXISTING SYSTEM	$\overline{\downarrow}$	HAND ACTUATOR OR HANDWHEEL		FIRST-LETTER		SUC	CEEDING-LETTERS				
(IPX	WHERE x = PANEL No. WHEN MORE THAN ONE PANEL IS PRESENT	ΔZ	DRAIN (FLOOR, SEWER, ETC.)	# 2	AIR ACTUATED VALVE W/POSITIONER		MEASURED OR			DOUT OR				
			FLOW STRAIGHTENING VANE		OPTIONAL: D - DIRECT ACTING POSITIONER		INITIATING VARIABLE	MODIFIER	PAS	SIVE FUNCTION	OUTPUT FUNCTI	TION	MODIFIER	
$\leftarrow - \rightarrow$	BEHIND BOARD MOUNTED INSTRUMENTS	\wedge		──────	R - REVERSE ACTING POSITIONER			I		arm				
		SP	SPECIALITY PART			INSTRUMENT / PROCESS	A Analysis							ice
		4		宁	VALVE FAIL SYMBOLS FO - FAIL OPEN	LINES DESIGNATIONS	B Burner/Combustion			ser's Choice	User's Choice		User's Choi	
	INSTRUMENTS SHARING COMMON HOUSING	SP 4 AV	SPECIALITY PART AIR VENT, AUTOMATIC	FC FC	FO - FAIL OPEN FC - FAIL CLOSED FL - FAIL LOCKED (LAST POSITION)	LINES DESIGNATIONS 000 UNDERGROUND INSTRUMENTS		Differential		ser's Choice	User's Choice Control		User's Cho	
	INSTRUMENTS SHARING COMMON HOUSING	4 P AV		FC FC	FO - FAIL OPEN FC - FAIL CLOSED	LINES DESIGNATIONS	B Burner/Combustion C User's Choice D User's Choice E Voltage		Use	er's Choice ensor (Primary Element)	Control		User's Cho	
		4 P AV		FC	FO - FAIL OPEN FC - FAIL CLOSED FL - FAIL LOCKED (LAST POSITION) FI - FAIL INDETERMINATE	UNDERGROUND INSTRUMENTS 100 PROCESS INSTRUMENTS	B Burner/Combustion C User's Choice D User's Choice	Differential Ratio (Fraction)	Sel		Control		User's Cho	
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XY XX	INSTRUMENTS SHARING COMMON HOUSING IN LINE INSTRUMENTS AS INDENTIFIED SIGNAL CONVERTER (INPUT/OUTPUT) * E - VOLTAGE P - PNEUMATIC	SELF-ACTUA	AIR VENT, AUTOMATIC ATED REGULATORS, VALVES,	FC ZSL	FO - FAIL OPEN FC - FAIL CLOSED FL - FAIL LOCKED (LAST POSITION) FI - FAIL INDETERMINATE LIMIT SWITCH ACTIVATED WHEN VALVE CLOSED (ZSH ACTIVATED WHEN VALVE OPEN)	UNDERGROUND INSTRUMENTS 100 PROCESS INSTRUMENTS 200 VENDOR SUPPLIED INSTRUMENTS 300 UTILITY INSTRUMENTS 0000 UNDERGROUND LINES 1000 PROCESS LINES	B Burner/Combustion C User's Choice D User's Choice E Voltage F Flow Rate G User's Choice		Se	ensor (Primary Element)	Control			
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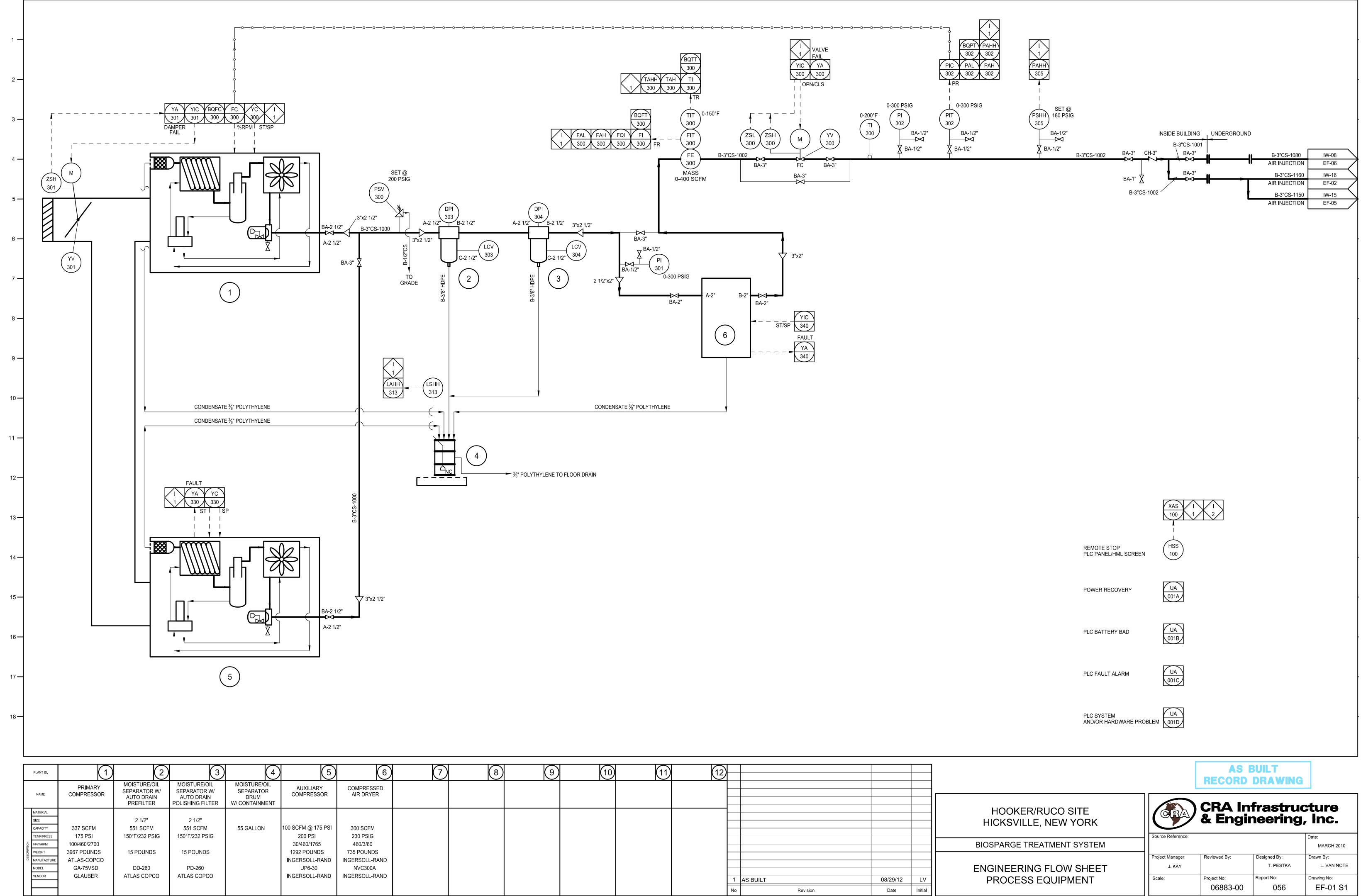
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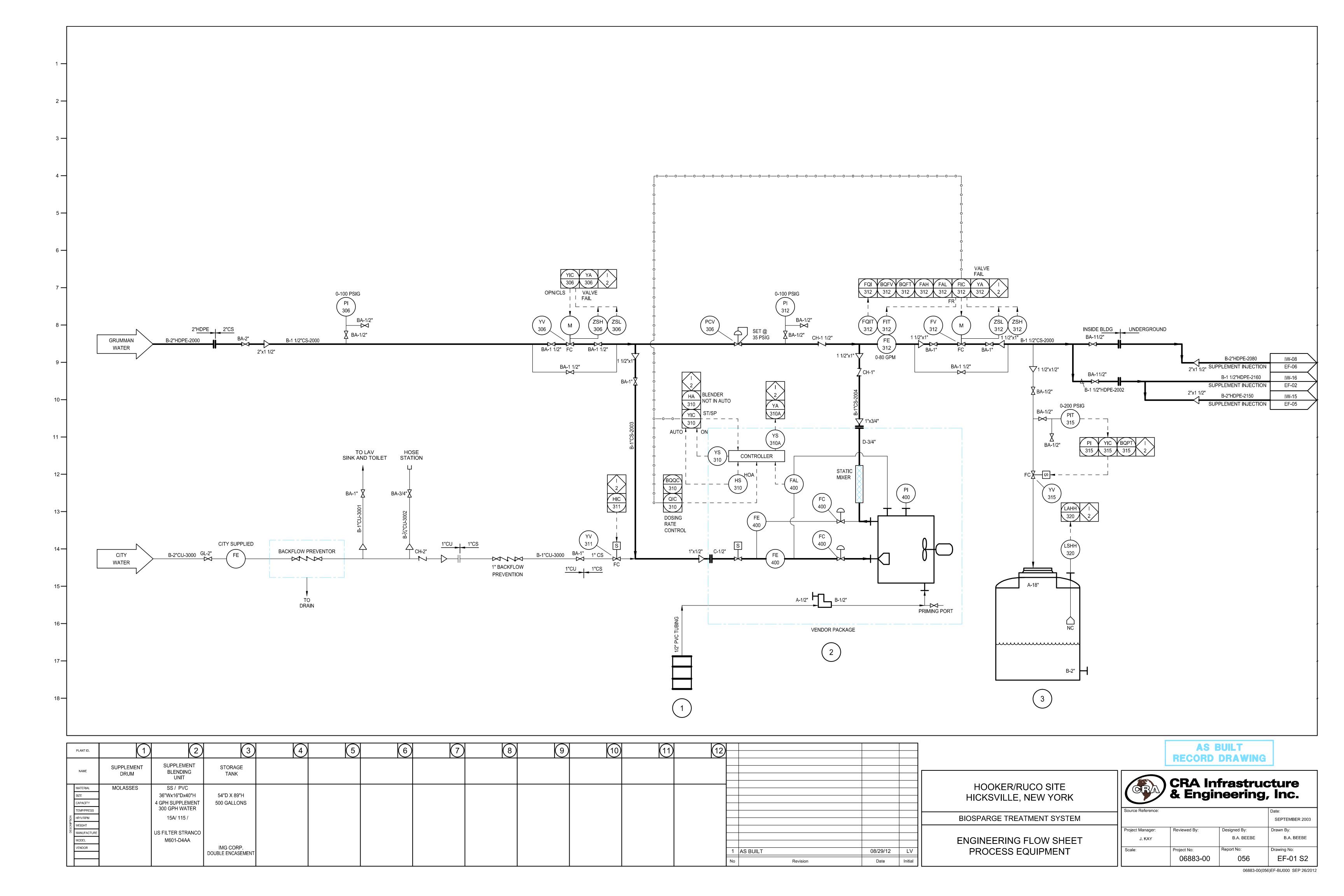
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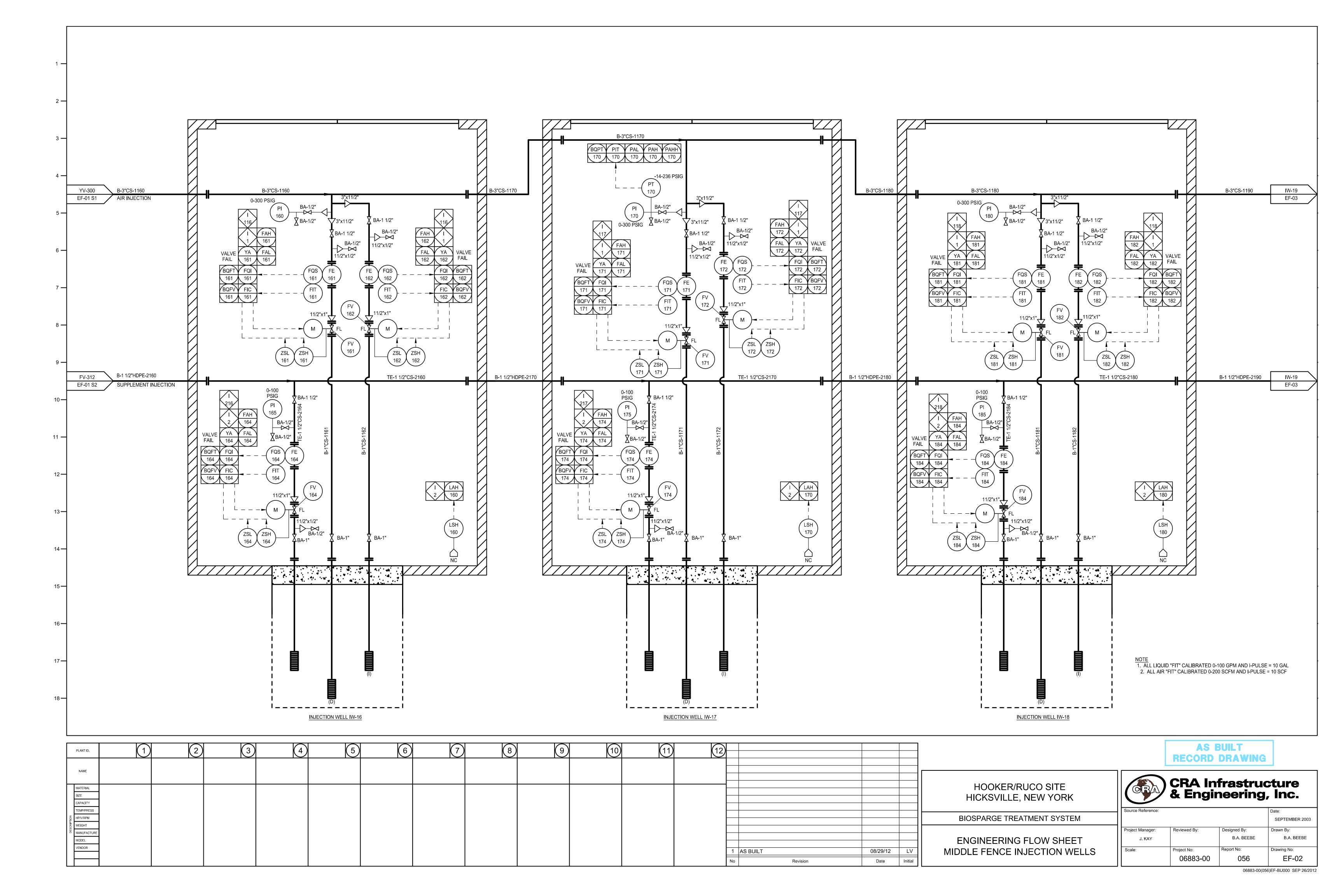
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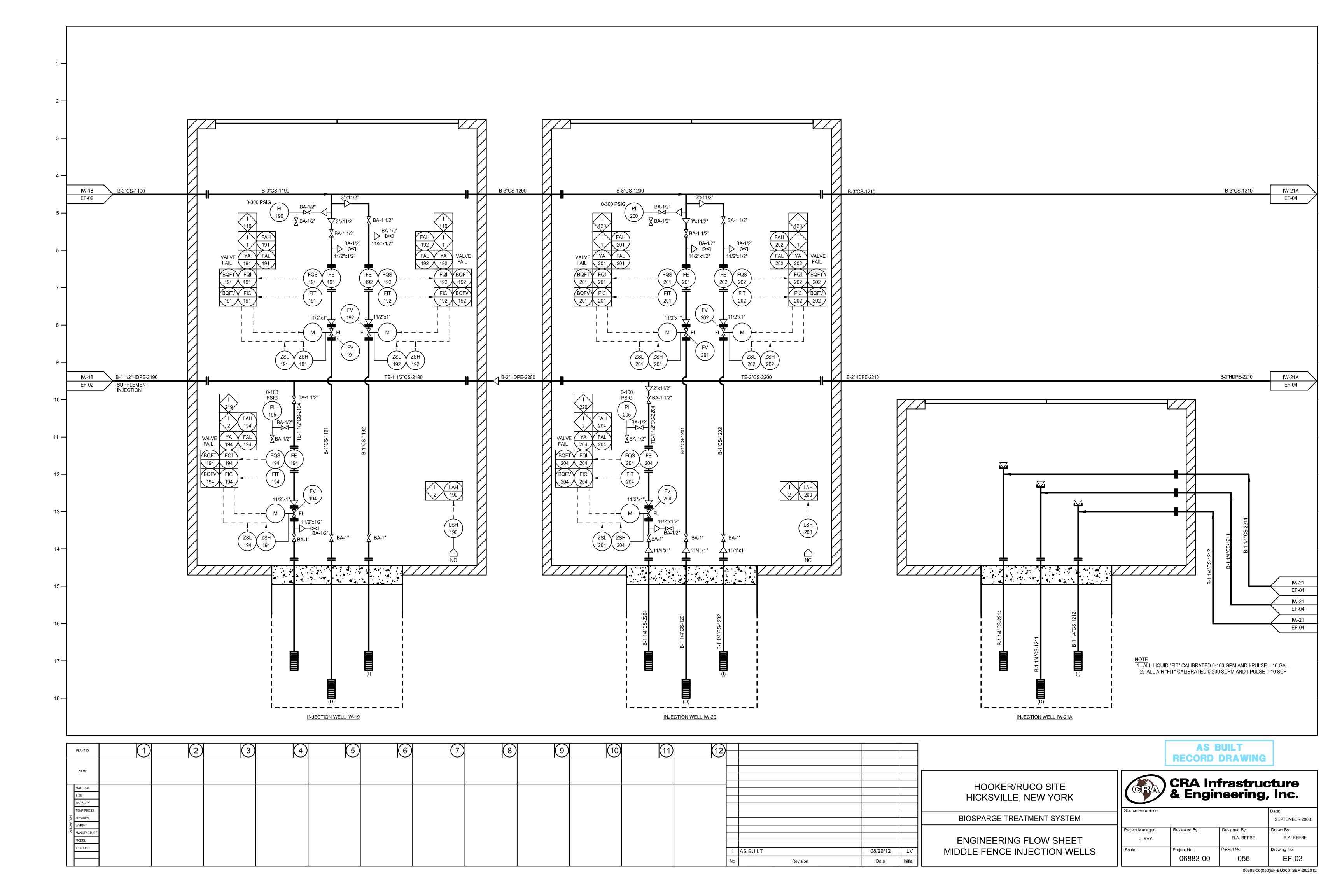
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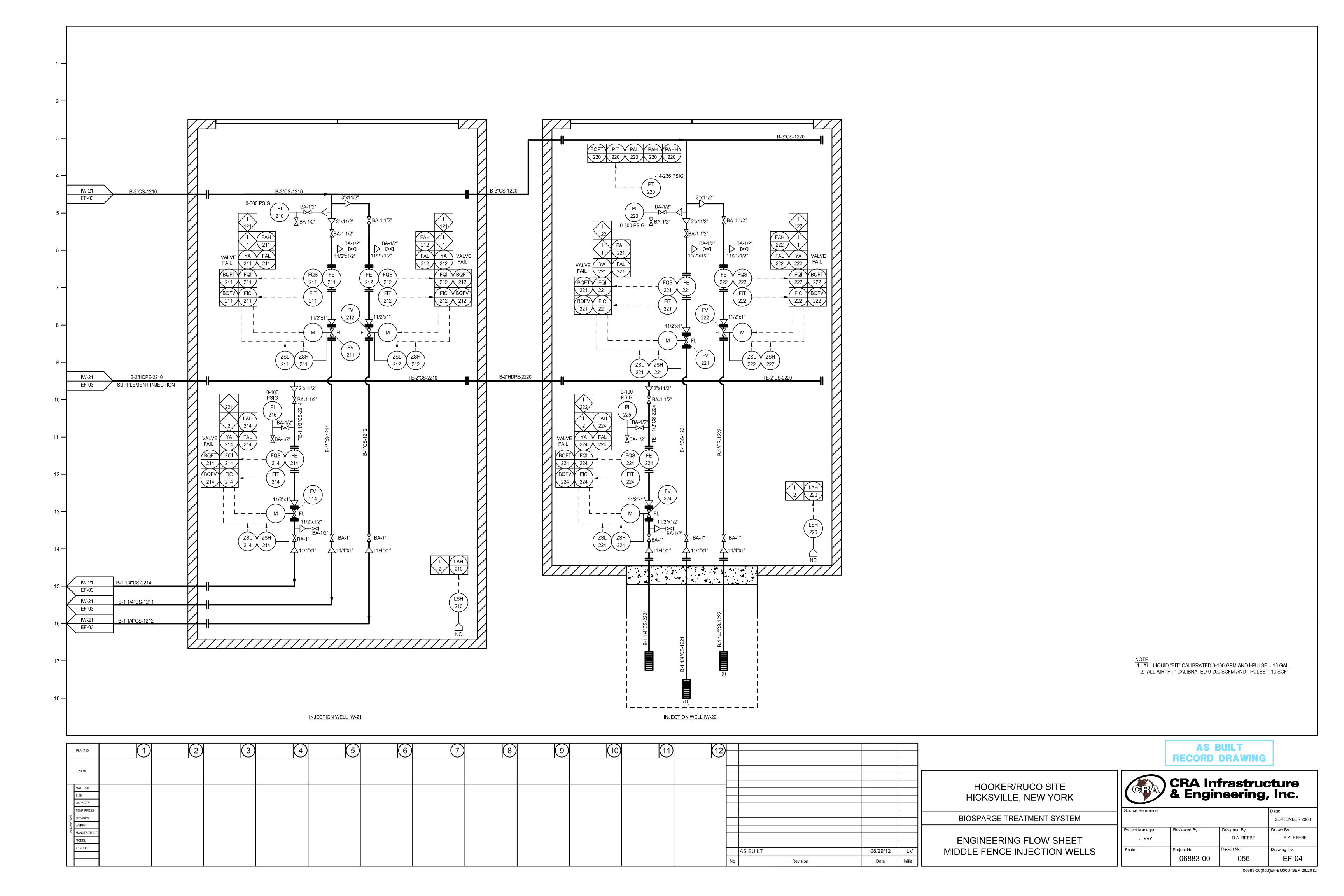


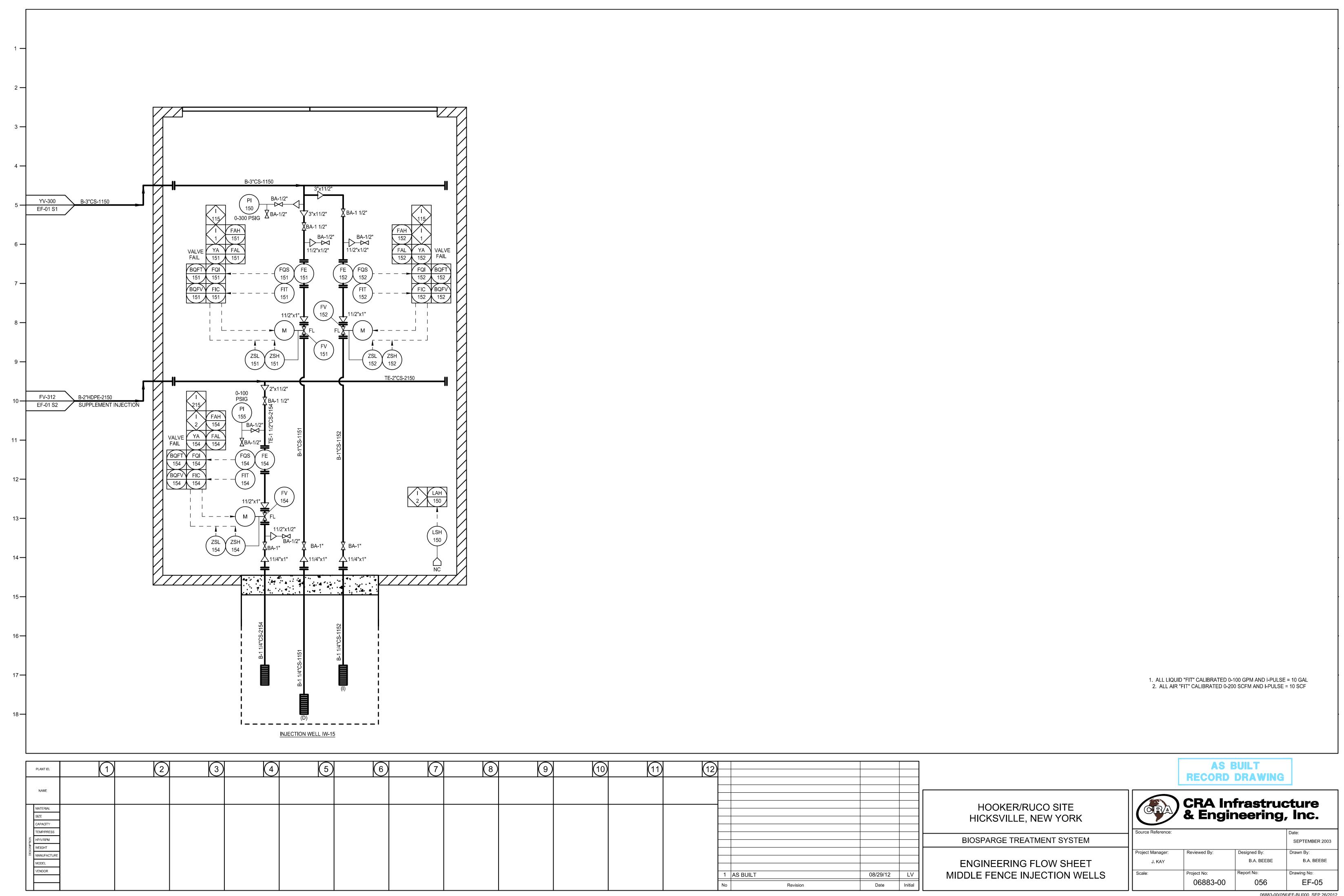
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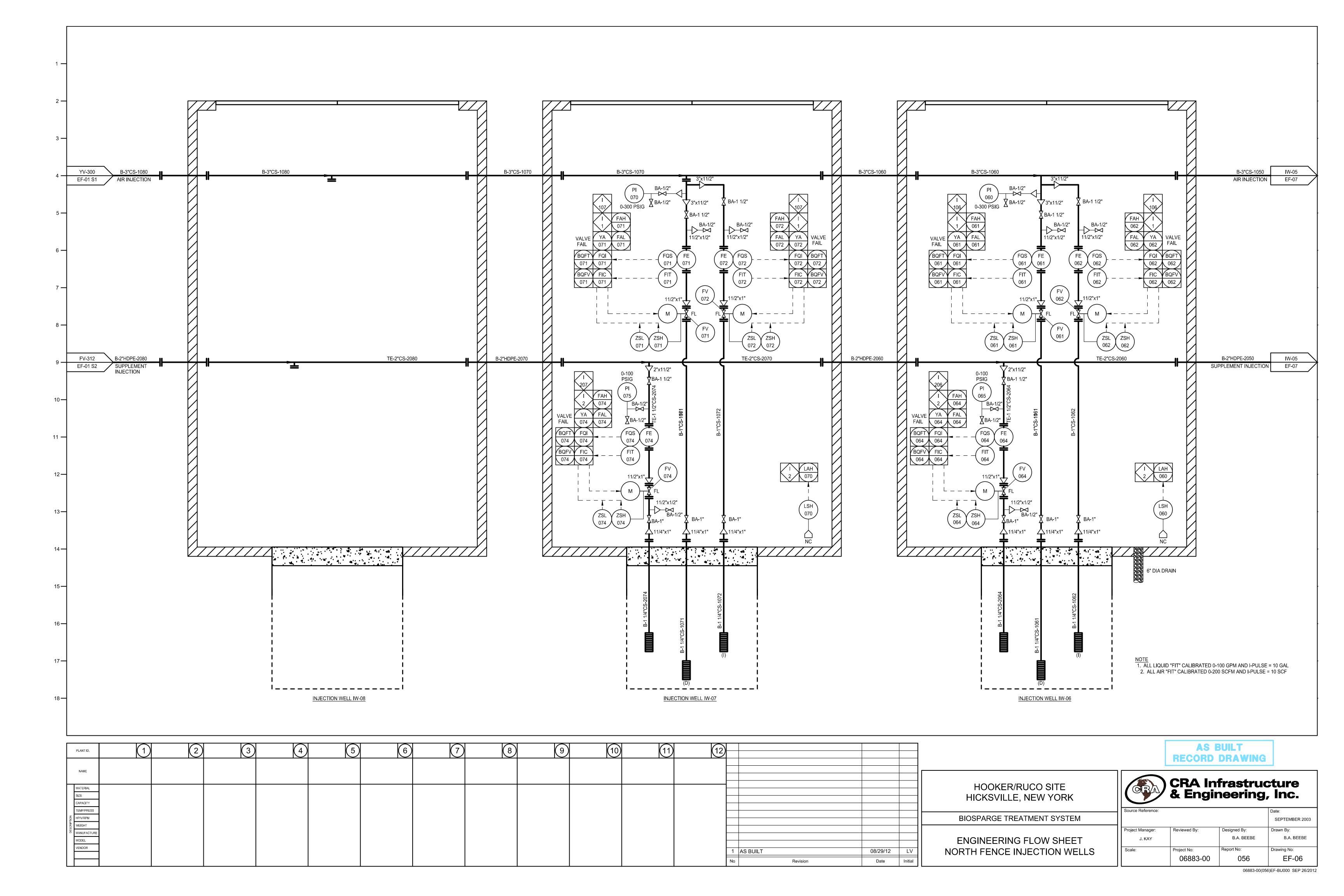


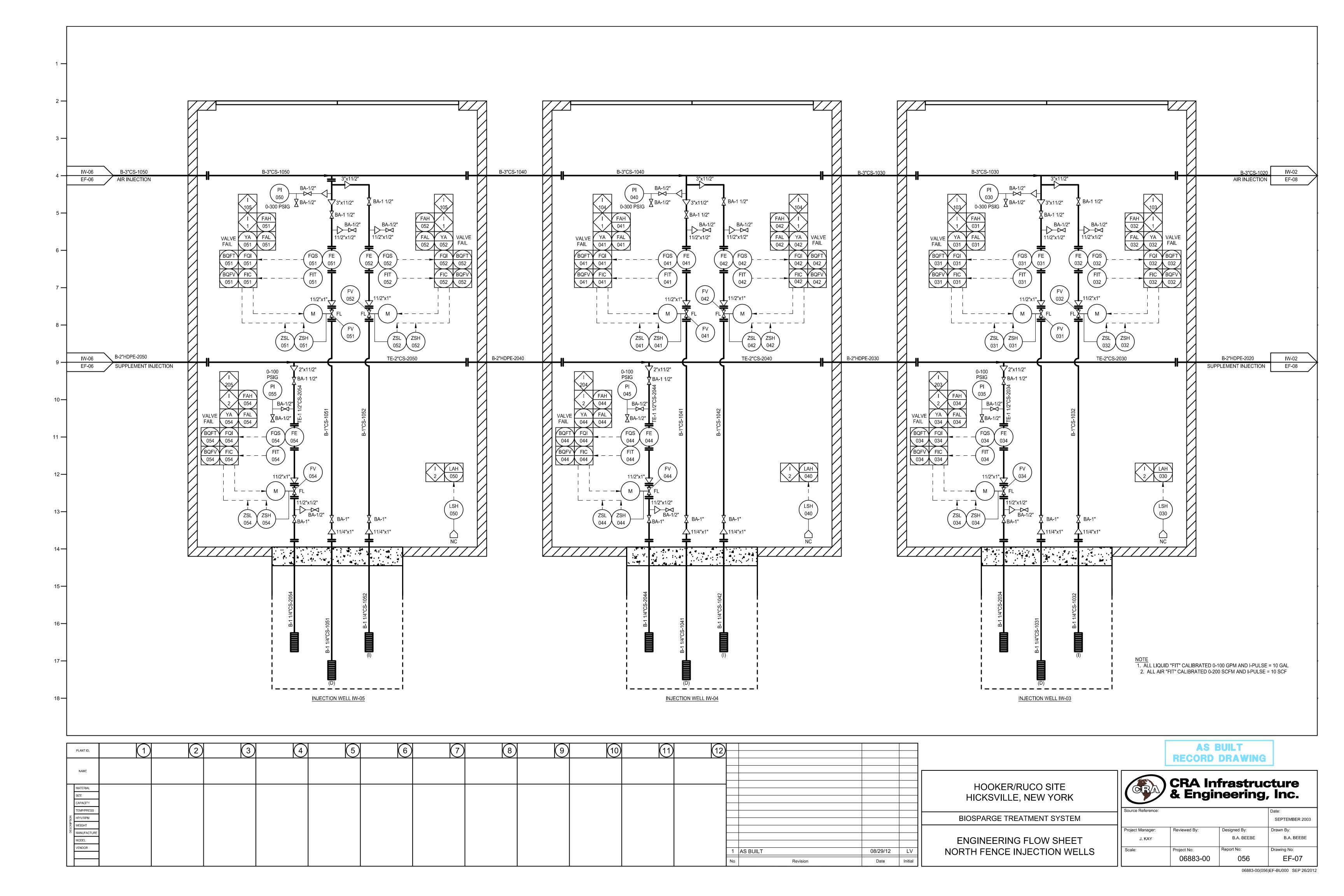


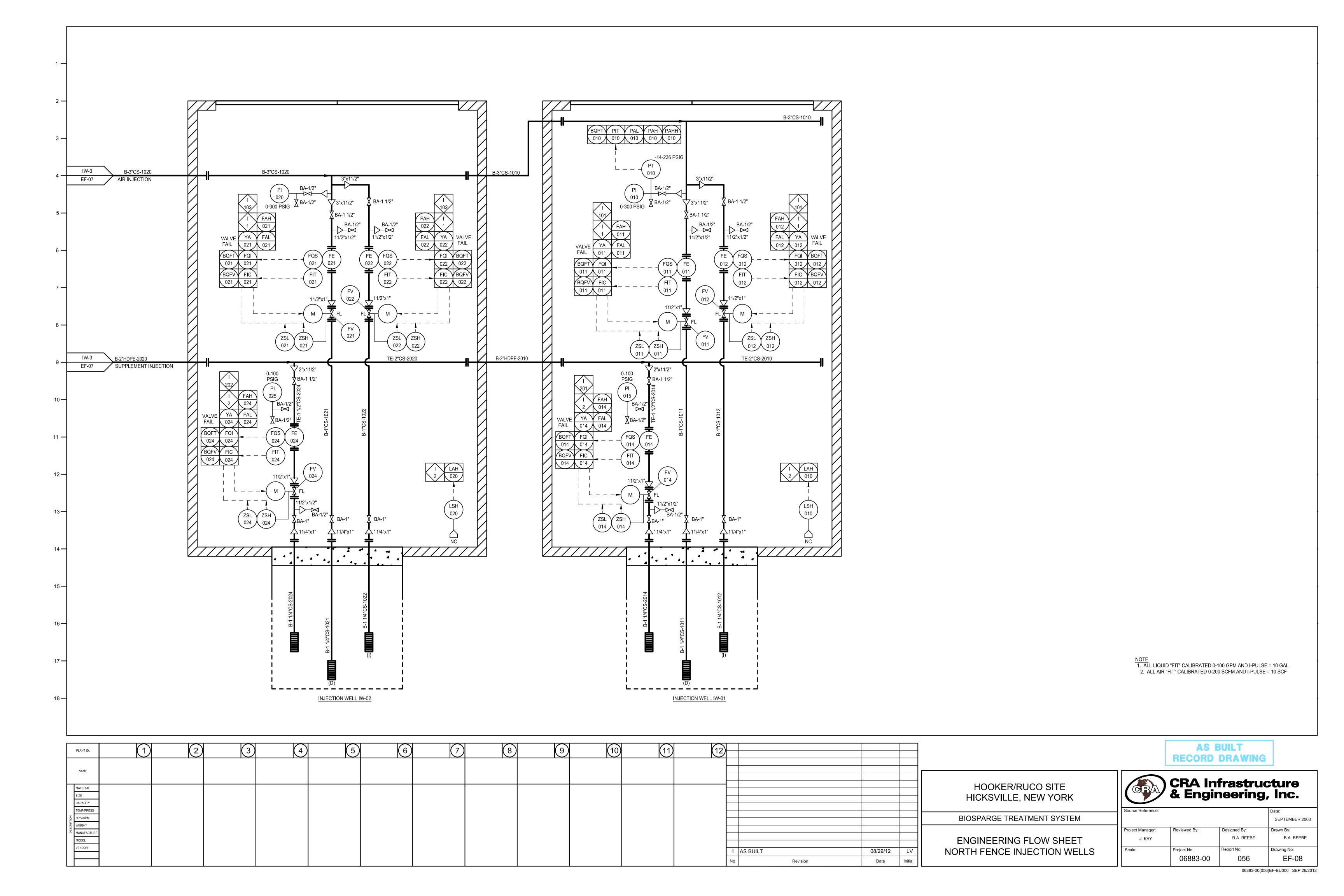


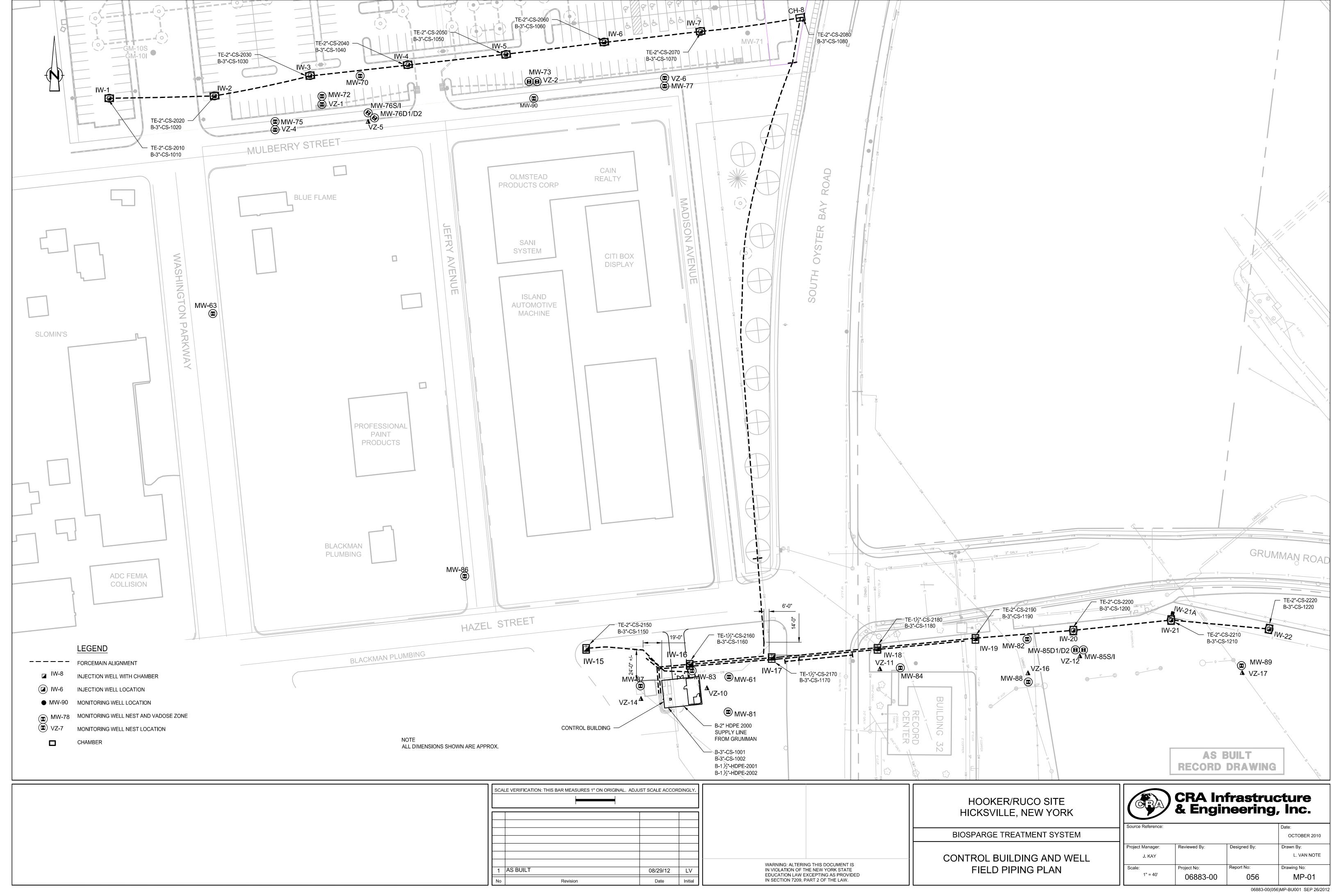


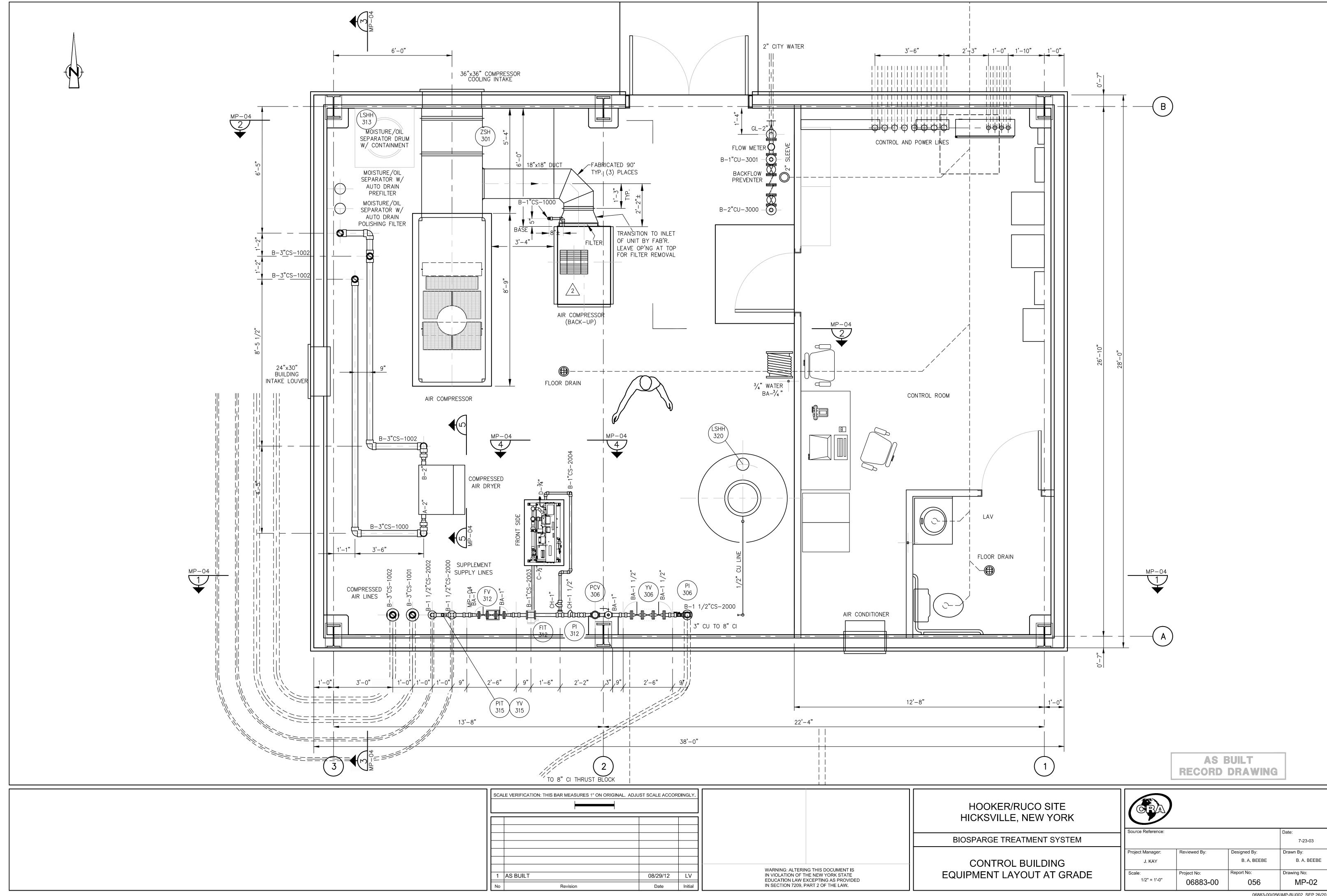
06883-00(056)EF-BU000 SEP 26/2012

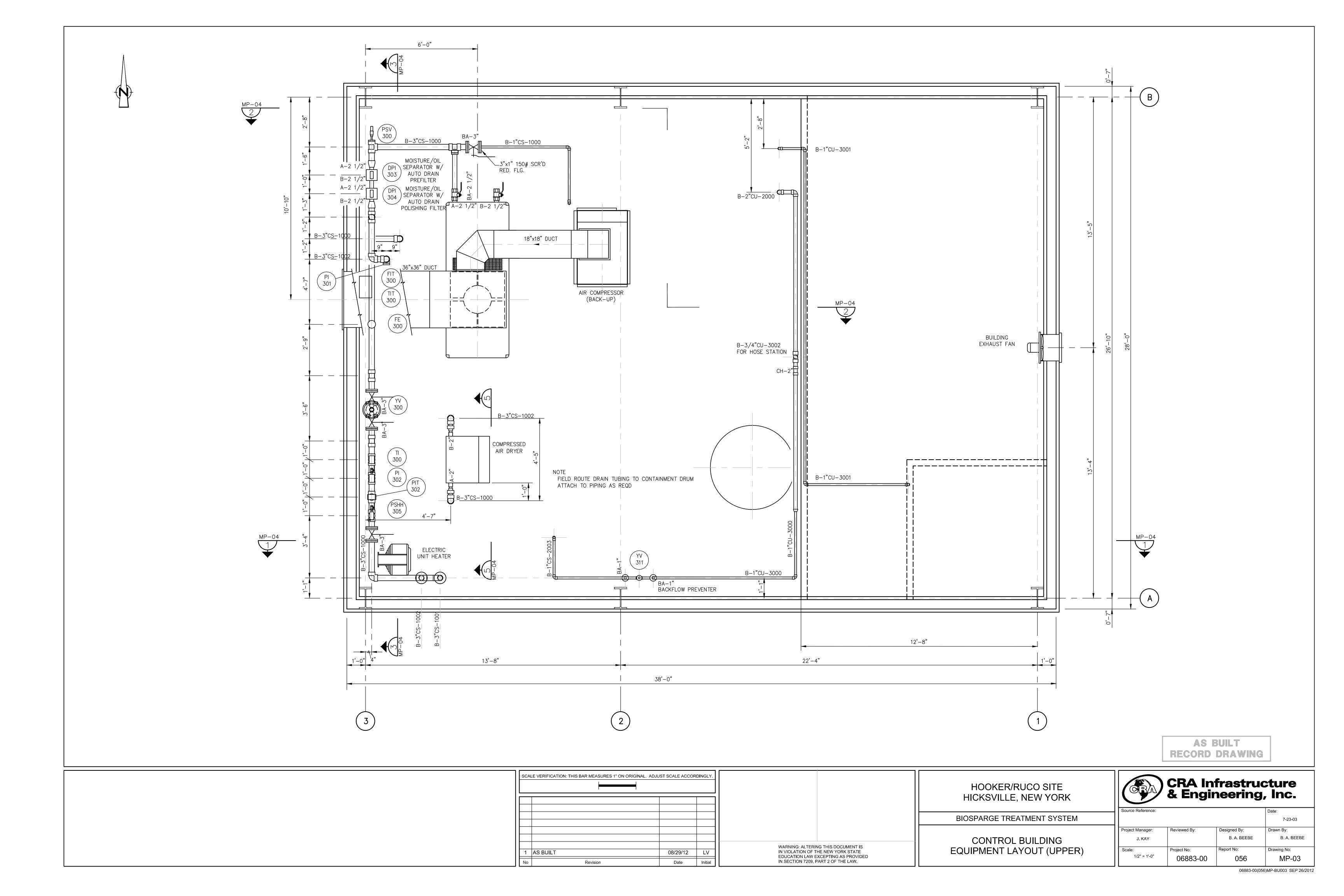


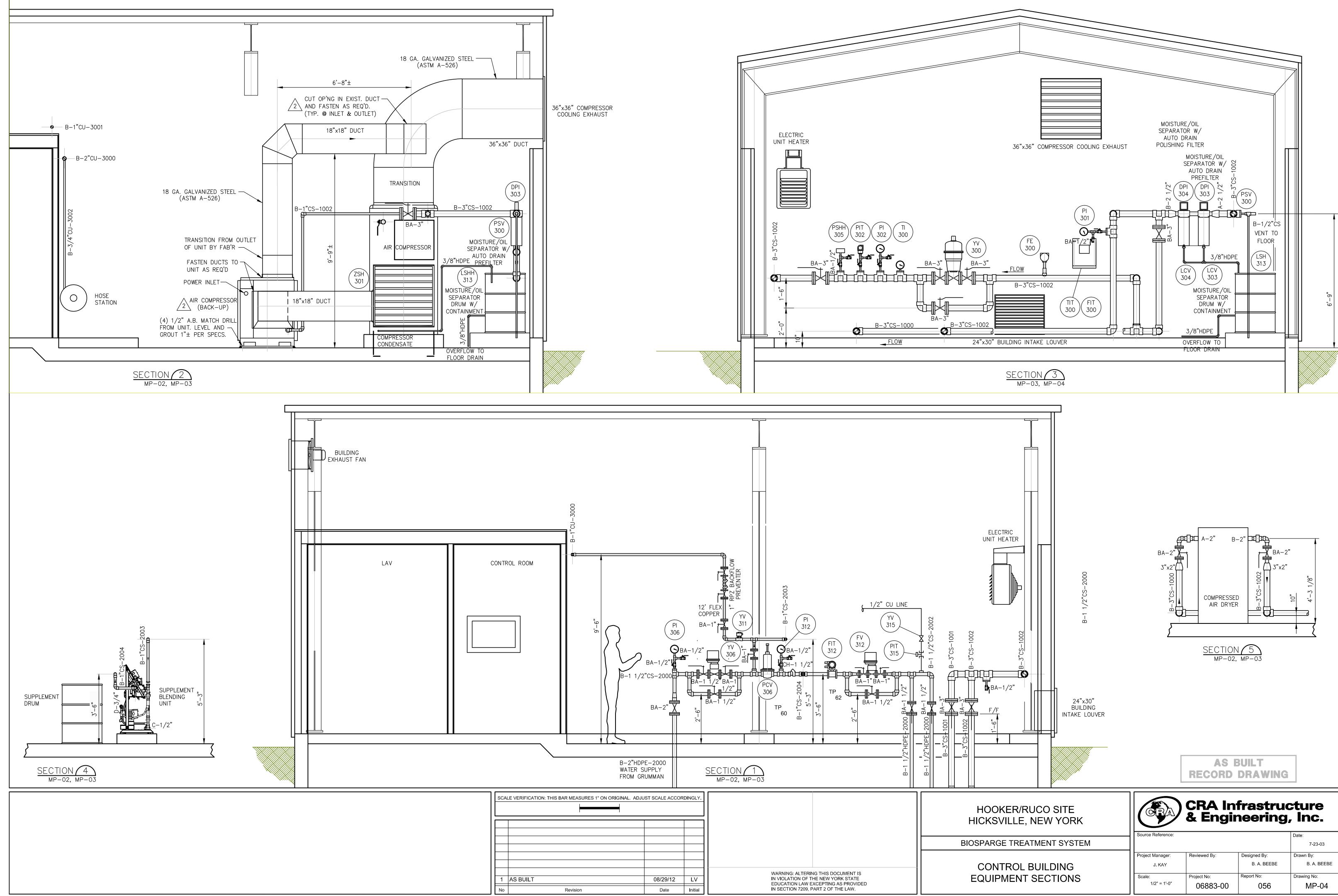


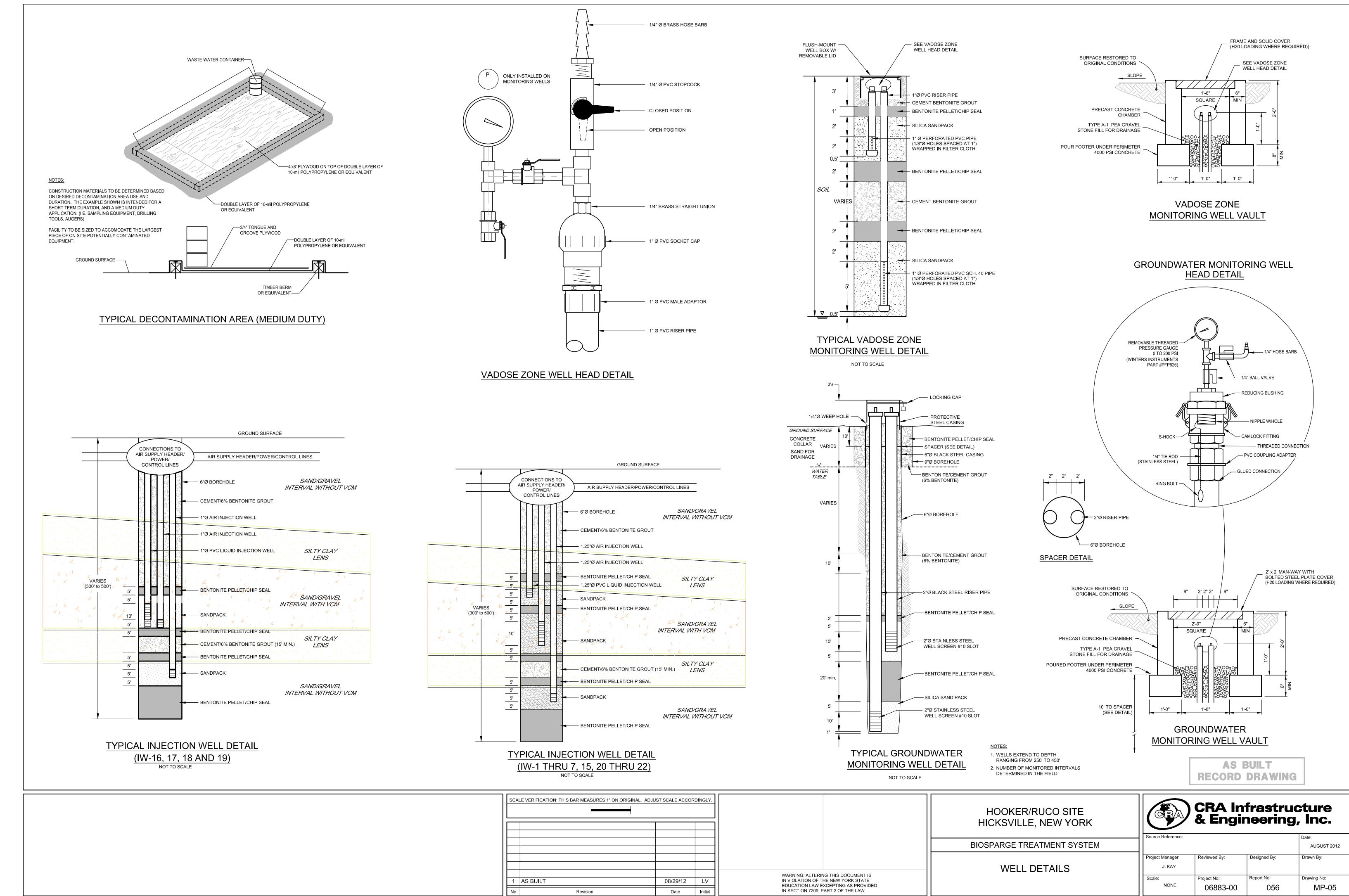


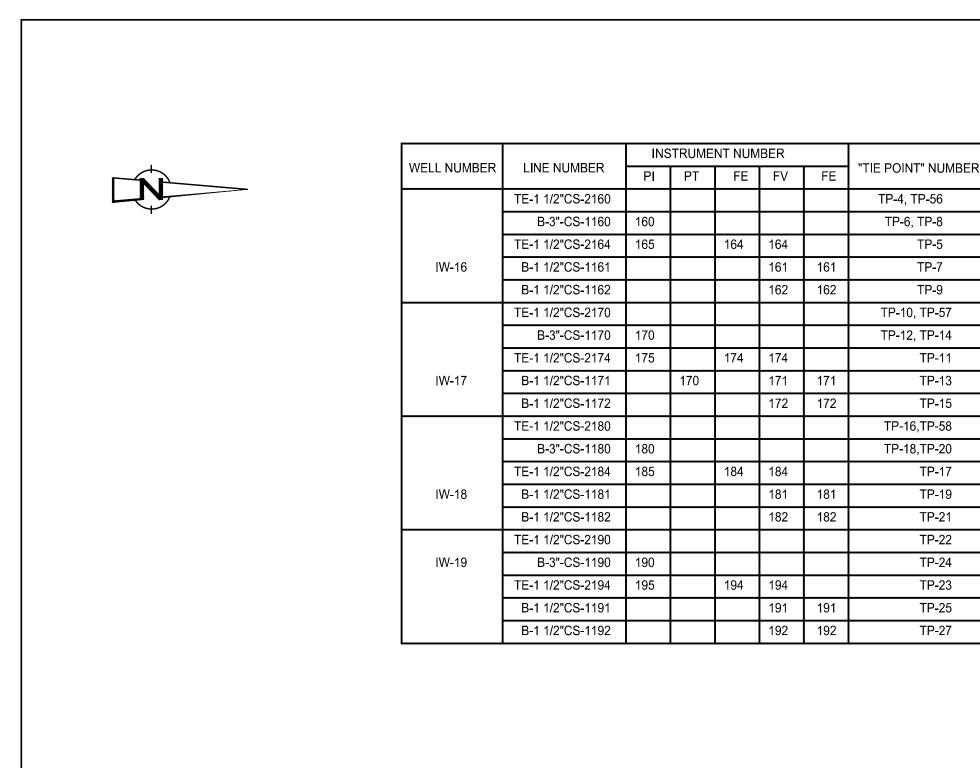


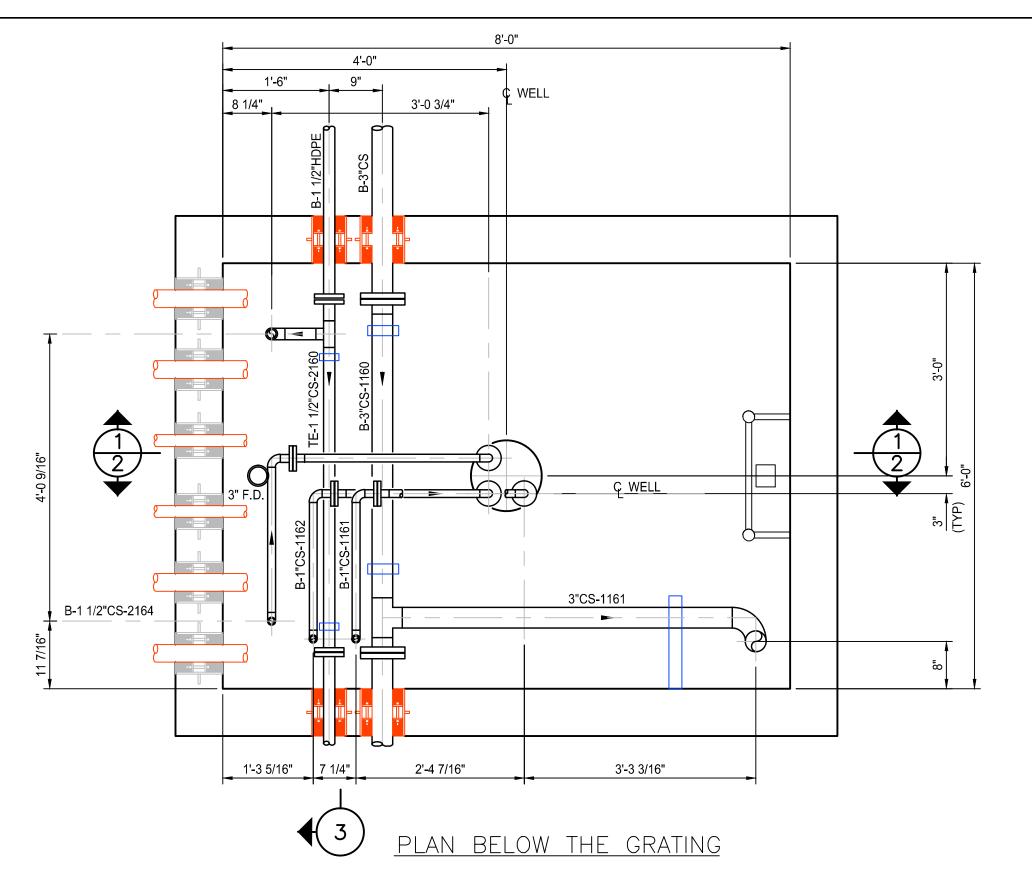


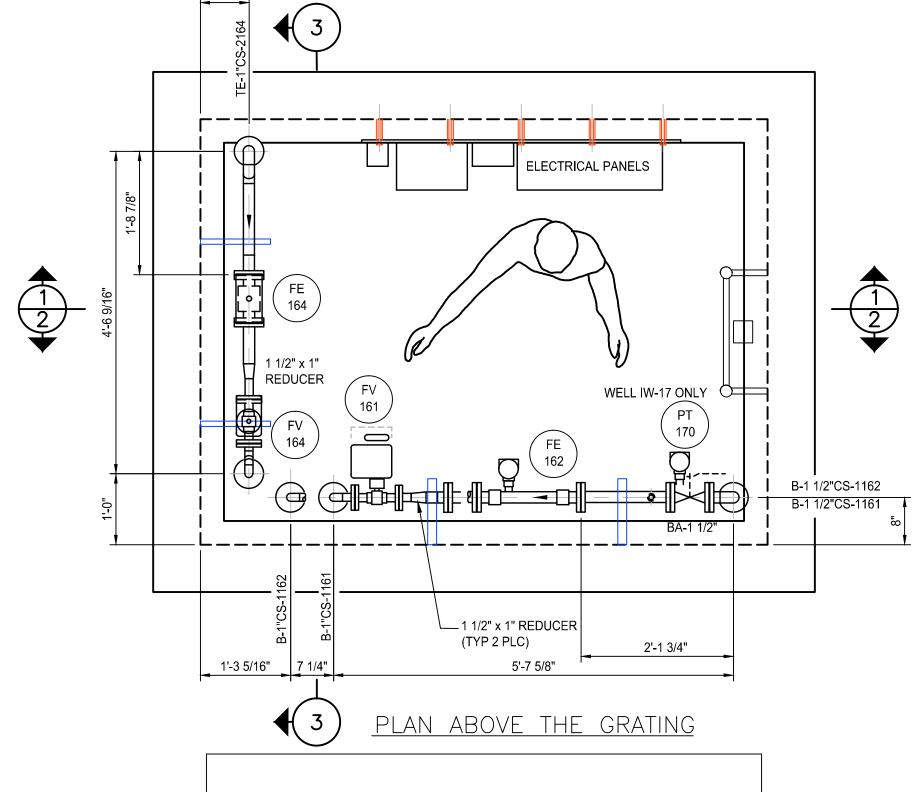


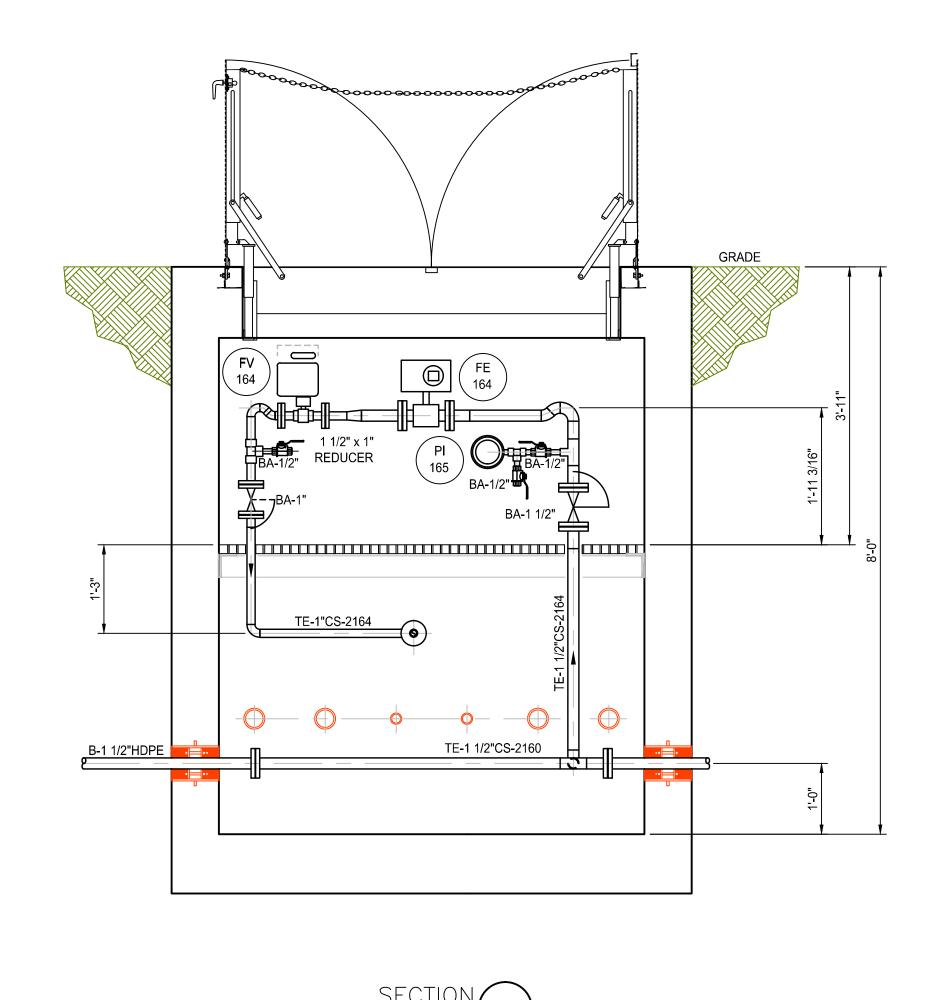


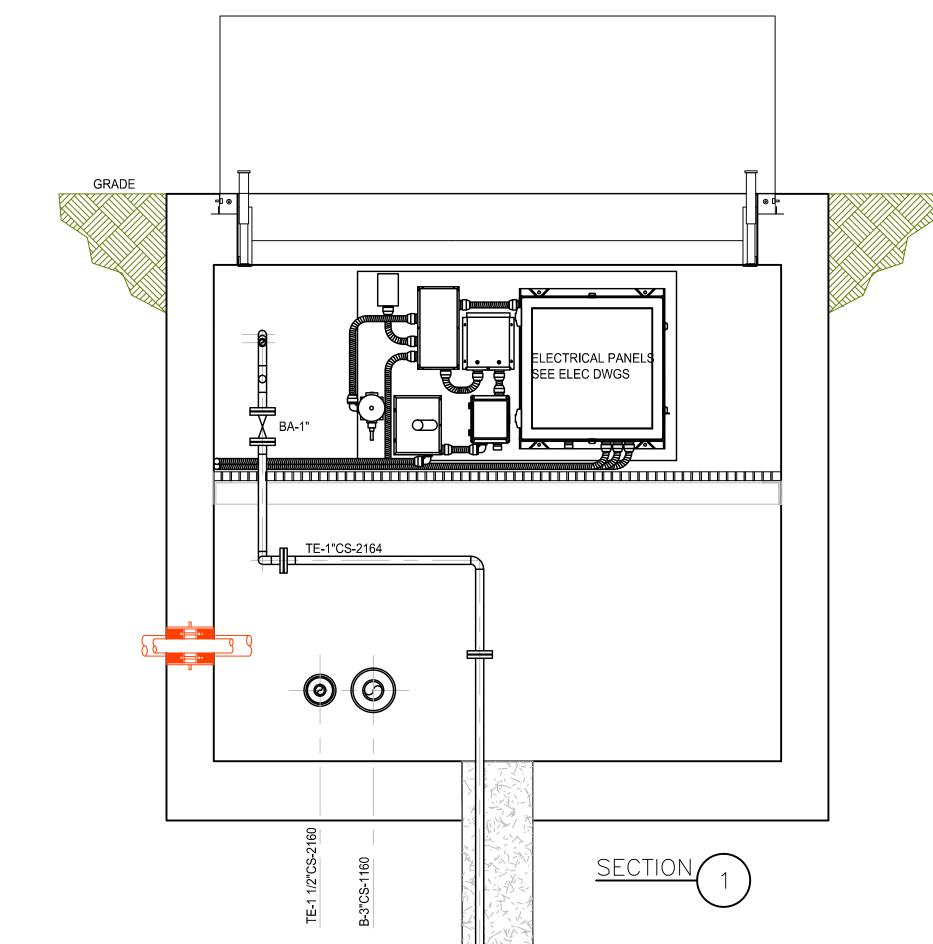


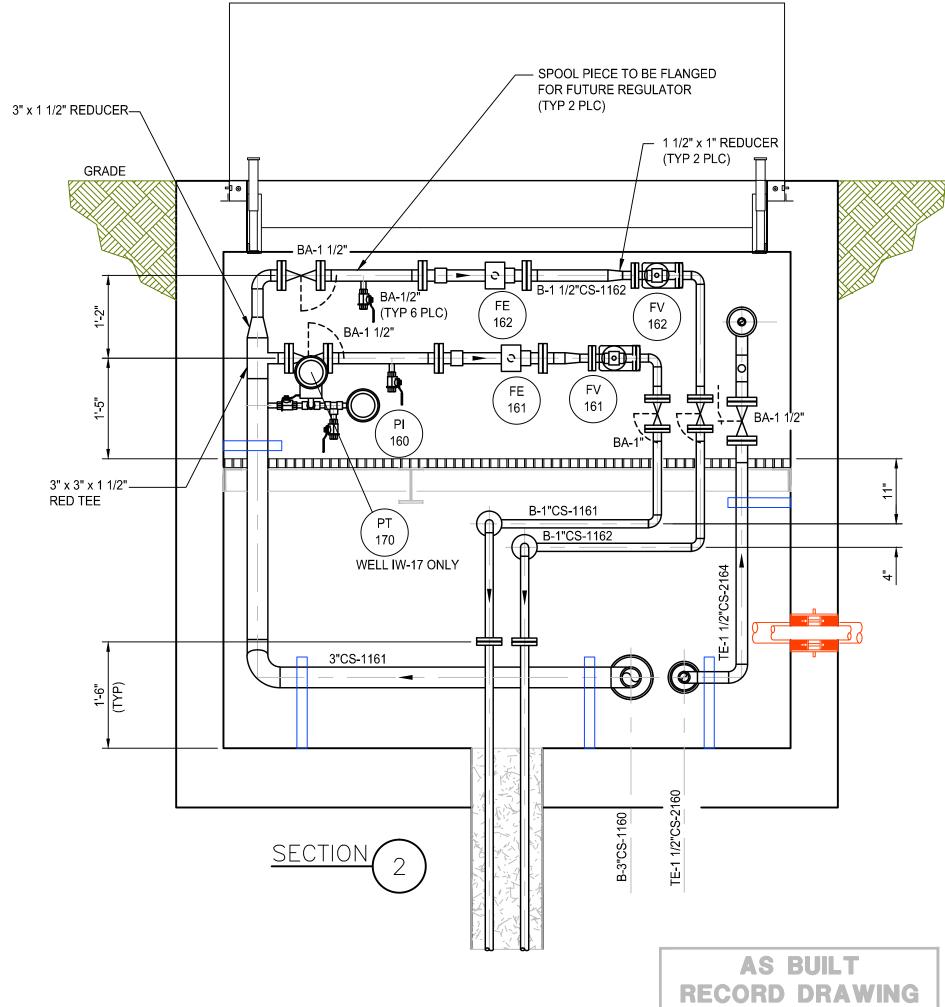








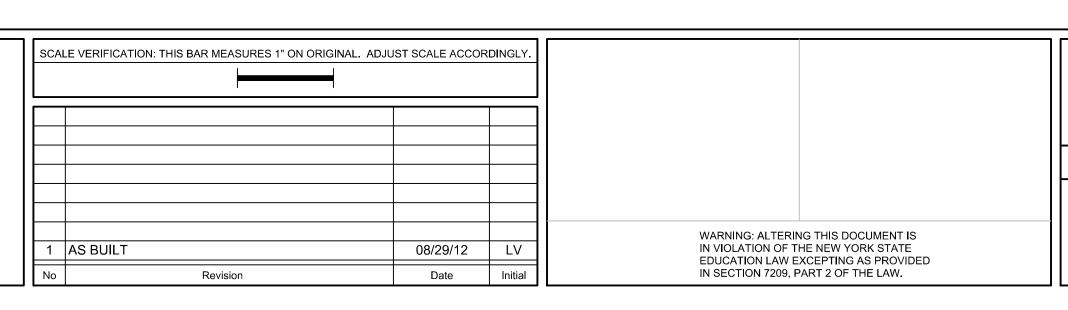




NOTES

- 1. THE VAULT SHOWN ABOVE IS FOR WELL IW-16. ALL VAULTS WERE PIPED AS PER THIS TYPICAL DRAWING. INSTRUMENT AND LINE NUMBERS FOR THE OTHER VAULTS MAY BE FOUND ON TABLE.
- 2. WELLS IW-01 THRU IW-07 ARE LOCATED NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE NORTH SIDE OF THE VAULT.
- 3. WELLS IW-15 THRU IW-22 ARE LOCATED JUST NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL
- LOCATED ON THE SOUTH SIDE OF THE VAULT.

 4. ALL AIR, LIQUID, CONTROL, AND ELECTRICAL LINES PASS THRU THE VAULTS, EXCEPT IW-1, IW-8, IW-15, AND IW-22. CONTRACTOR
- PLUGGED ANY ADDITIONAL HOLES IN THESE VAULTS.
- 5. WATER FLOW METER FE-XX4 CONFIGURED FOR REVERSE FLOW AND INSTALLED BACKWARD.



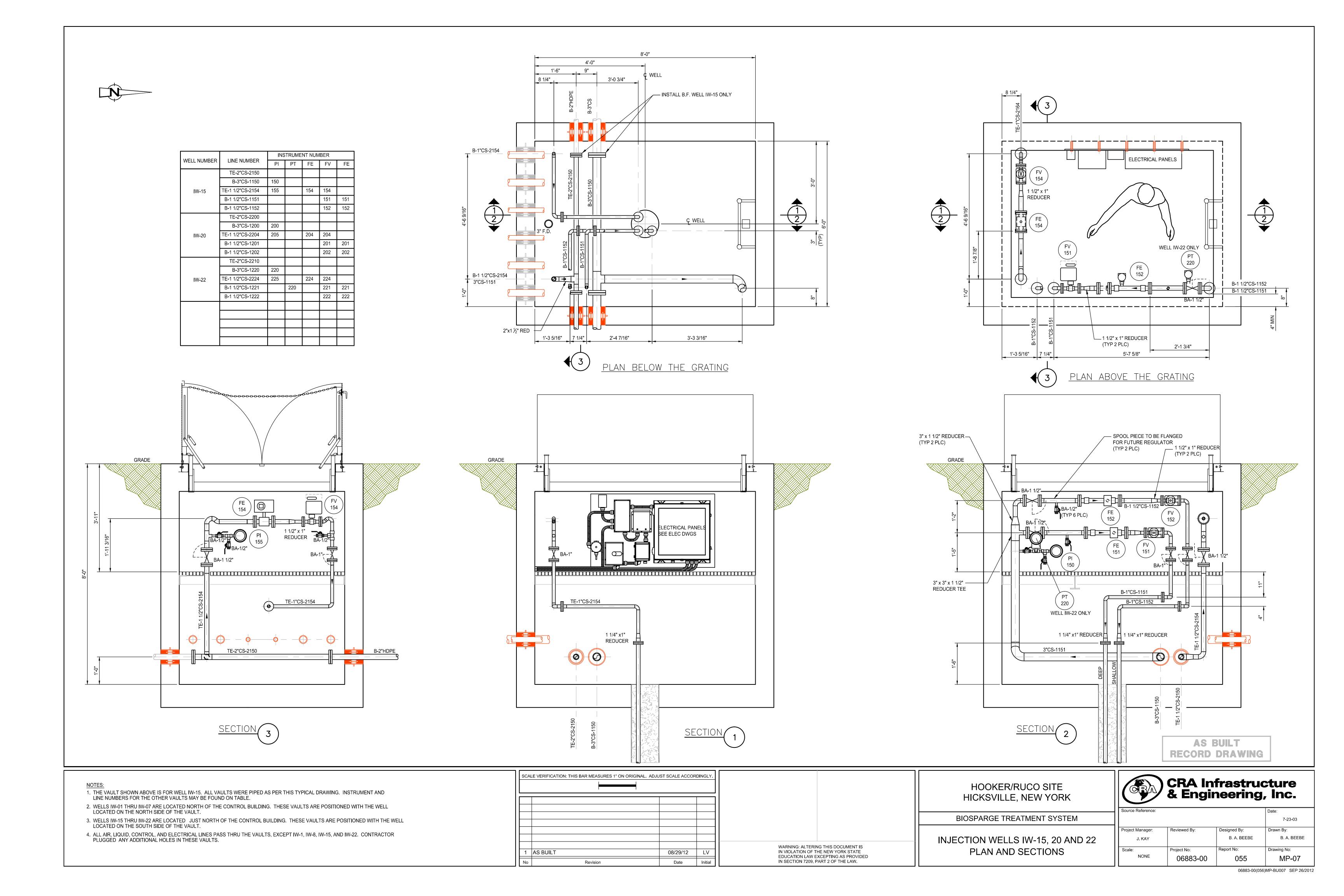
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

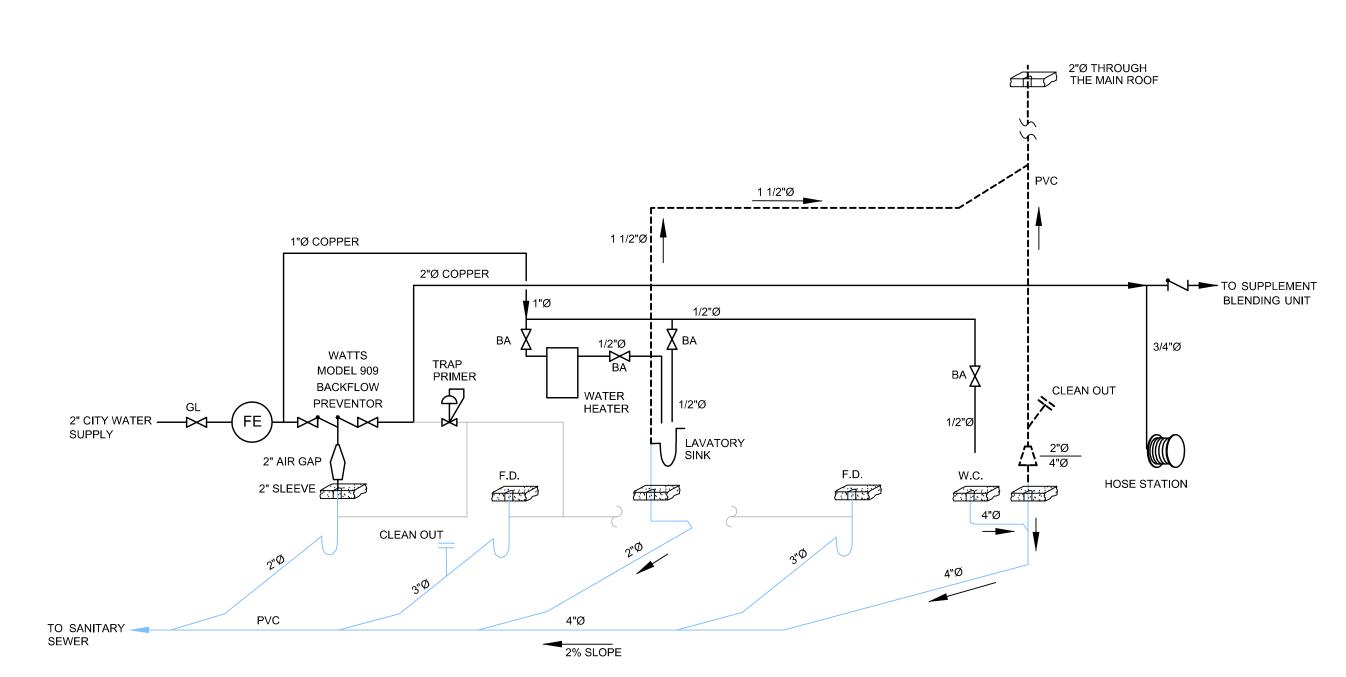
BIOSPARGE TREATMENT SYSTEM

INJECTION WELLS IW-16, 17, 18 & 19

PLAN AND SECTIONS

 Source Reference:			Date:
			7-23-03
Project Manager:	Reviewed By:	Designed By:	Drawn By:
J. KAY		B. A. BEEBE	B. A. BEEBE
Scale:	Project No:	Report No:	Drawing No:
NONE	06883-00	056	MP-06





GENERAL PLUMBING NOTES:

- 1. ALL WORKS MUST COMPLY WITH NEW YORK PLUMBING CODE.
- REFER TO WRITTEN SPECIFICATIONS FOR SPECS ON FIXTURES, PIPING MATERIALS, INSTALLATIONS, ETC., UNLESS INDICATED OTHERWISE.
- 3. THESE PLANS MAKE NO ATTEMPT TO SHOW ALL ITEMS
 REQUIRED FOR COMPLETE INSTALLATION. ALL FIXTURES
 MUST BE ROUGHED IN AND INSTALLED IN STRICT ACCORDANCE
 WITH MFG'S SHOP DWGS AND INSTALLATION PROCEDURES.
 CONTRACTOR MUST FURNISH AND INSTALL ALL ITEMS, FITTINGS,
 AND MISCELLANEOUS HARDWARE NEEDED FOR PLUMBING-CODE
 COMPLIANCE AND COMPLETE OPERATIONAL SERVICE AND
 MAINTENANCE.

LAVATORY PLUMBING

NOT TO SCALE

AS BUILT RECORD DRAWING

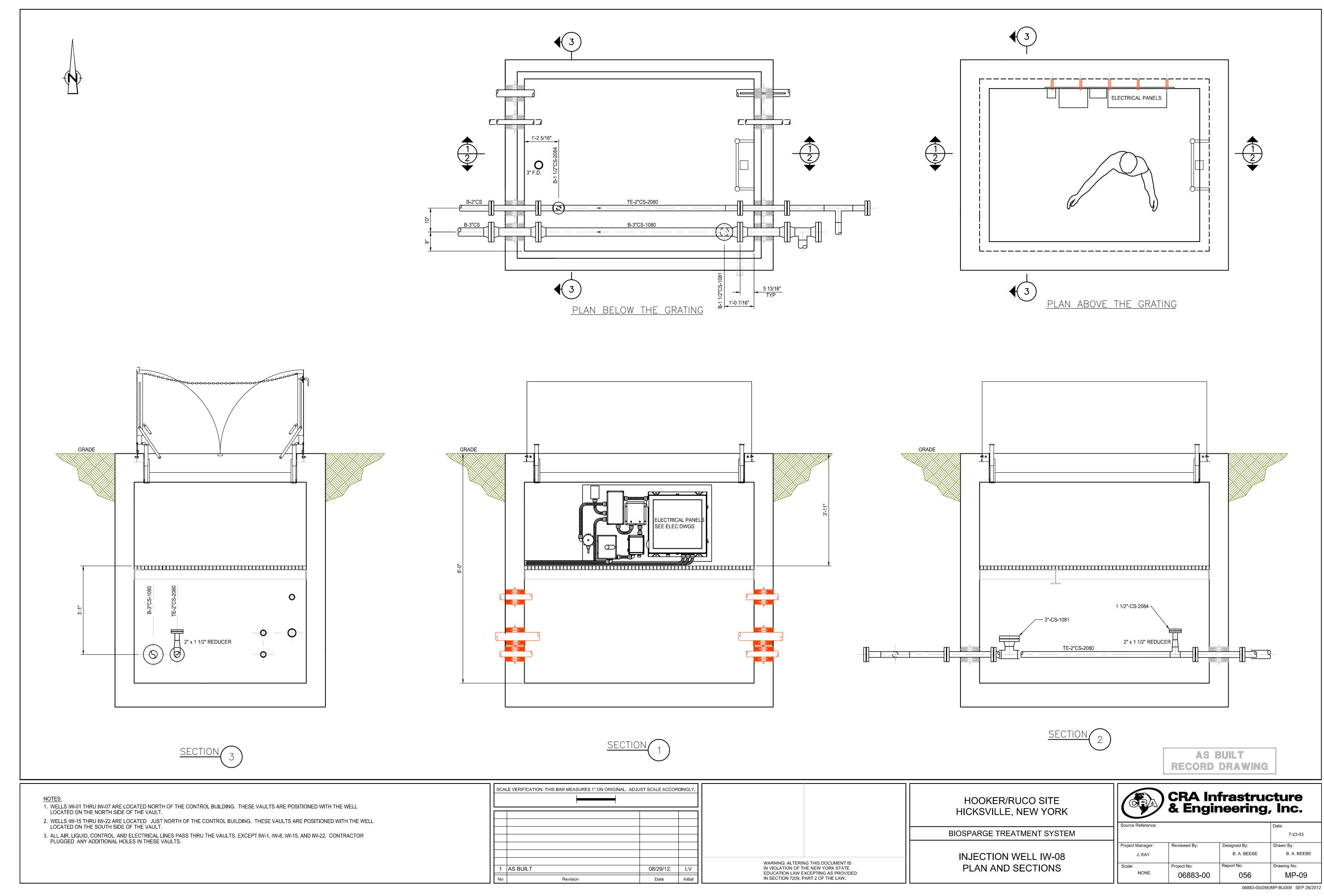
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

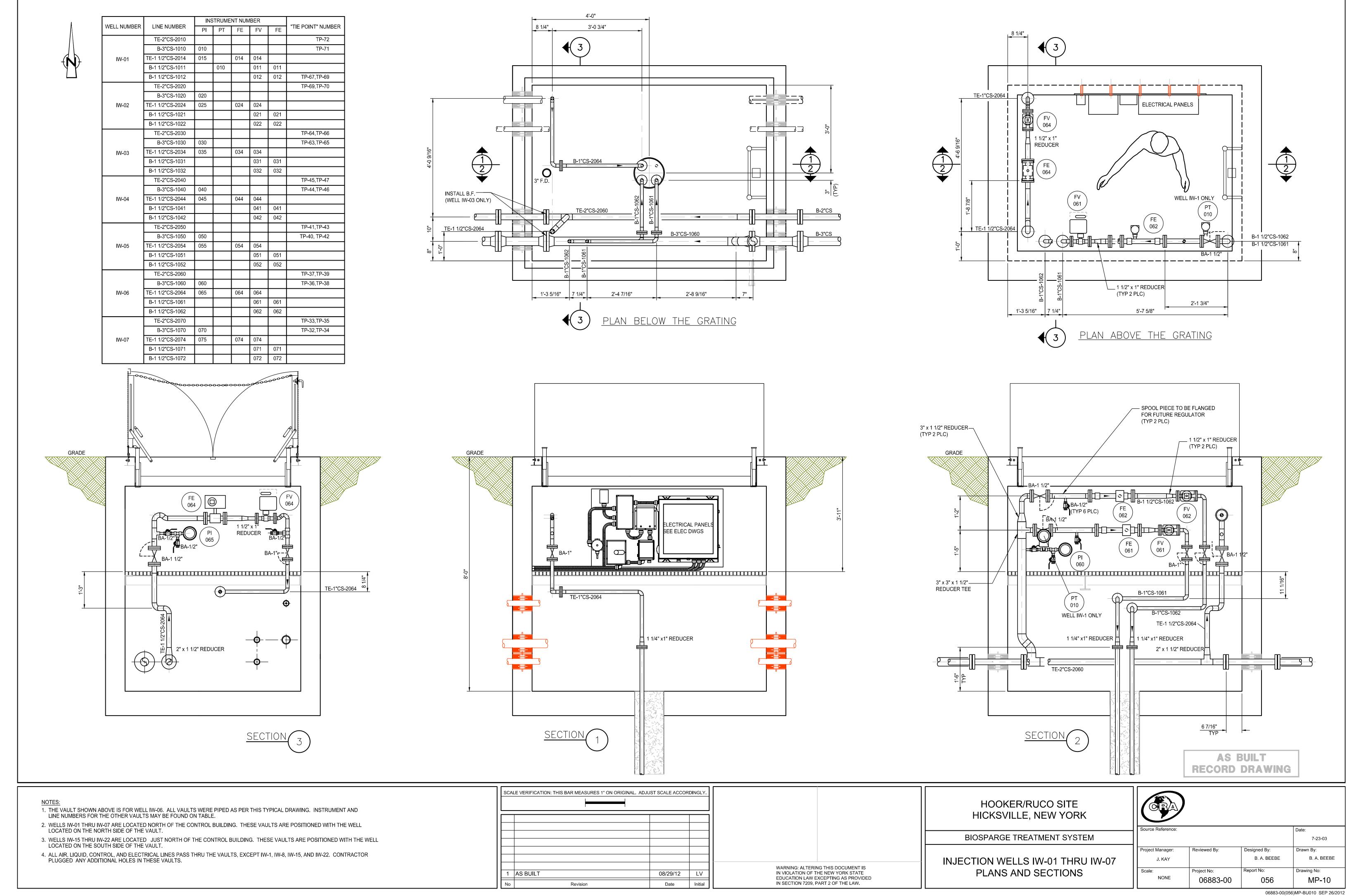
BIOSPARGE TREATMENT SYSTEM

LAVATORY PLUMBING



		AUGUST 2012
ger: Reviewed By:	Designed By:	Drawn By:
Υ		
Project No:	Report No:	Drawing No:
^{1E} 06883-	-00 056	MP-08
_	Project No:	Project No: Report No:





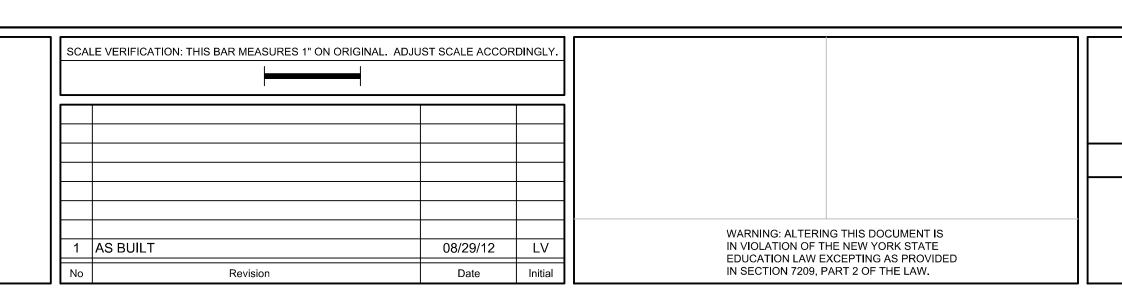
) F) (DECODIDATION (TO 8 EDOM)			DATE COMPLETED	Т	RACED		INSULAT	ION	TIE DOINT N	DEMARKO
L۷	SIZE & LINE No.	DESCRIPTION (TO & FROM)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT No.	REMARKS
	3"CS-1000	PRIMARY AIR COMPR TO COMPR AIR DRYER	MP-02, 03 & 04	EF-01 S1		N	N	N	N	N		INSIDE BLDG
	3"CS-1001	3"CS-1002 TO 3"CS-1080	MP-01	EF-01 S1		N	N	N	N	N		NORTH, UNDERGROUND
	3"CS-1002	COMPR AIR DRYER TO 3"CS-1160	MP-02, 03 & 04	EF-01 S1		N	N	N	N	N		INSIDE BLDG
	3"CS-1010	3"CS-1020 (IW-02) TO END	MP-01, 10	EF-08		N	N	N	N	N		IW-01
	3"CS-1011	3"CS-1010 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-01
	3"CS-1012	3"CS-1011 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-01
	3"CS-1020	3"CS-1030 (IW-03) TO 3"CS-1010 (IW-01)	MP-01, 10	EF-08		N	N	N	N	N		IW-02
	3"CS-1021	3"CS-1020 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-02
	3"CS-1022	3"CS-1021 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-02
	3"CS-1030	3"CS-1040 (IW-04) TO 3"CS-1020 (IW-02)	MP-01, 10	EF-07		N	N	N	N	N		IW-03
	3"CS-1031	3"CS-1030 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-03
	3"CS-1032	3"CS-1031 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-03
	3"CS-1040	3"CS-1050 (IW-05) TO 3"CS-1030 (IW-03)	MP-01, 10	EF-07		N	N	N	N	N		IW-04
	3"CS-1041	3"CS-1040 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-04
	3"CS-1042	3"CS-1041 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-04
	3"-CS-1050	3"CS-1060 (IW-06) TO 3"CS-1040 (IW-04)	MP-01, 10	EF-07		N	N	N	N	N		IW-05
	3"CS-1051	3"CS-1050 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-05
	3"CS-1052	3"CS-1051 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-05
	3"-CS-1060	3"CS-1070 (IW-07) TO 3"CS-1050 (IW-05)	MP-01, 10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1061	3"CS-1060 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1062	3"CS-1061 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1070	3"CS-1080 (IW-08) TO 3"CS-1060 (IW-06)	MP-01, 10	EF-06		N	N	N	N	N		IW-07
	3"CS-1071	3"CS-1070 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-07
	3"CS-1072	3"CS-1071 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-07
	3"-CS-1080	3"CS-1001 TO 3"CS-1070	MP-01, 09	EF-06		N	N	N	N	N		IW-08

E\/	SIZE & LINE No.	DESCRIPTION (TO & FROM)	DIDING DDAWING		DATE COMPLETED	TI	RACED		INSULATI	ON	TIE POINT No.	REMARKS
_V	SIZE & LINE NO.	DESCRIPTION (TO & FROM)	FIFING DRAWING	F & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE FOINT NO.	REWARKS
	3"CS-1150	3"CS-1060 TO 3"CS-1140 (IW-15)	MP-01, 06	EF-01 S1, 05		N	N	N	N	N		IN TRENCH
	3"CS-1151	3"CS-1150 TO WELL	MP-07	EF-05		N	N	N	N	N		IW-15
	3"CS-1152	3"CS-1151 TO WELL	MP-07	EF-05		N	N	N	N	N		IW-15
	3"CS-1160	3"CS-1002 TO 3"CS-1170 (IW-17)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-16
	3"CS-1161	3"CS-1160 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-16
	3"CS-1162	3"CS-1161 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-16
	3"-CS-1170	3"CS-1160 (IW-16) TO 3"CS-1180 (IW-18)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-17
	3"-CS-1171	3"CS-1170 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-17
	3"-CS-1172	3"CS-1171 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-17
	3"-CS-1180	3"CS-1170 (IW-17) TO 3"CS-1190 (IW-19)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-18
	3"-CS-1181	3"CS-1180 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-18
	3"-CS-1182	3"CS-1181 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-18
	3"-CS-1190	3"CS-1180 (IW-18) TO 3"CS-1200 (IW-20)	MP-01, 06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1191	3"CS-1190 TO WELL	MP-06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1192	3"CS-1191 TO WELL	MP-06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1200	3"CS-1190 (IW-19) TO 3"CS-1210 (IW-21)	MP-01, 07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1201	3"CS-1200 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1202	3"CS-1201 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1210	3"CS-1200 (IW-20) TO 3"CS-1220 (IW-22)	MP-01, 07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1211	3"CS-1210 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1212	3"CS-1211 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1220	3"CS-1210 (IW-21) TO END	MP-01, 07	EF-04		N	N	N	N	N		IW-22
	3"-CS-1221	3"CS-1220 TO WELL	MP-07	EF-04		N	N	N	N	N		IW-22
	3"-CS-1222	3"CS-1221 TO WELL	MP-07	EF-04		N	N	N	N	N		IW-22

DEM	CIZE 9 LINE No	DECODIDITION (TO 8 EDOM)			DATE COMPLETED	TI	RACED		INSULATI	ON	TIE DOINT NA	DEMARKS
₹ΕV	SIZE & LINE NO.	DESCRIPTION (TO & FROM)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT No.	REMARKS
	1 1/2"CS-2000	WATER SUPPLY TO 2"HDPE-2080	MP-02, 04	EF-01 S2		N	N	N	N	N		INSIDE BLDG
	1"CS-2004	1 1/2"CS-2000 TO SUPPLEMENT BLENDING UNIT	MP-02, 04	EF-01 S2		N	N	N	N	N		INSIDE BLDG
	2"CS-2010	2"HDPE-2030 (IW-03) TO END	MP-01, 10	EF-08			Y					IW-01
	1 1/2"CS-2014	2"HDPE-2010 TO WELL	MP-10	EF-08			Y					IW-01
	2"CS-2020	2"HDPE-2030 (IW-03) TO 2"HDPE-2010 (IW-01)	MP-01, 10	EF-08			Y					IW-02
	1 1/2"CS-2024	2"HDPE-2020 TO WELL	MP-10	EF-08			Υ					IW-02
	2"CS-2030	2"HDPE-2040 (IW-04) TO 2"HDPE-2020 (IW-02)	MP-01, 10	EF-07			Y					IW-03
	1 1/2"CS-2034	2"HDPE-2030 TO WELL	MP-10	EF-07			Y					IW-03
	2"CS-2040	2"HDPE-2050 (IW-05) TO 2"HDPE-2030 (IW-03)	MP-01, 10	EF-07			Y					IW-04
	1 1/2"CS-2044	2"HDPE-2040 TO WELL	MP-10	EF-07			Y					IW-04
	2"CS-2050	2"HDPE-2060 (IW-06) TO 2"HDPE-2040 (IW-04)	MP-01, 10	EF-07			Y					IW-05
	1 1/2"CS-2054	2"HDPE-2050 TO WELL	MP-10	EF-07			Υ					IW-05
	2"CS-2060	2"HDPE-2070 (IW-07) TO 2"HDPE-2050 (IW-05)	MP-01, 10	EF-06			Y					IW-06
	1 1/2"CS-2064	2"HDPE-2060 TO WELL	MP-10	EF-06			Y					IW-06
	2"CS-2070	2"HDPE-2080 (IW-08) TO	MP-01, 10	EF-06			Y					IW-07
	2 00 2010	2"HDPE-2060 (IW-06)	WI 01, 10	<u> </u>			1					144 01
	1 1/2"CS-2074	2"HDPE-2070 TO WELL	MP-10	EF-06			Y					IW-07
	2"HDPE-2080	1 1/2"CS-2000 TO	MP-01, 09	EF-06			Y					IW-08
		2"HDPE-2070 (IW-07)										

) [\ /	CIZE 9 LINE No	DESCRIPTION (TO & FROM)	DIDING DDAWING		DATE COMPLETED	TI	RACED	ļ	INSULATI	ON	TIE POINT No.	REMARKS
. V	SIZE & LINE NO.	DESCRIPTION (TO & FROW)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT NO.	REIVIARNO
	2"HDPE-2150	1 1/2"HDPE-2160 TO	MP-01, 07	EF-01 S2, 05			Υ					IN TRENCH
		2"HDPE-2140										
	1"CS-2154	1 1/2"CS-2150 TO WELL	MP-07	EF-05			Y					IW-15
	1 1/2"HDPE-2160	1 1/2"HDPE-2002 TO	MP-01, 06	EF-01 S1, 02			Y					IW-16
		1 1/2"HDPE-2170 (IW-17)										
	1 1/2"CS-2164	1 1/2"CS-2160 TO WELL	MP-06	EF-02			Y					IW-16
	1 1/2"HDPE-2170	1 1/2"HDPE-2160 (IW-16) TO	MP-01, 06	EF-02			Υ					IW-17
		1 1/2"HDPE2180 (IW-18)										
	1 1/2"CS-2174	1 1/2"CS-2170 TO WELL	MP-06	EF-02			Υ					IW-17
	1 1/2"HDPE-2180	1 1/2"HDPE-2170 (IW-17) TO	MP-01, 06	EF-02			Y					IW-18
		1 1/2"HDPE2190 (IW-19)										
		1 1/2"CS-2180 TO WELL	MP-06	EF-02			Υ					IW-18
	1 1/2"HDPE-2190	1 1/2"HDPE-2180 (IW-18) TO	MP-01, 06	EF-03			Υ					IW-19
		1 1/2"HDPE2200 (IW-20)										
		2"CS-2190 TO WELL	MP-06	EF-03			Y					IW-19
		2"HDPE-2190 (IW-19) TO	MP-01, 07	EF-03			Υ					IW-20
		2"HDPE2210 (IW-21)										
		2"CS-2200 TO WELL	MP-07	EF-03			Y					IW-20
	2"HDPE-2210	2"HDPE-2200 (IW-20) TO	MP-01, 07	EF-03			Υ					IW-21
		2"HDPE2220 (IW-22)										
	1 1/2"CS-2214	2"CS-2210 TO WELL	MP-07	EF-03			Y					IW-21
	2"HDPE-2220	1 1/2"HDPE-2210 (IW-21) TO END	MP-01, 07	EF-04			Y					IW-22
	1 1/2"CS-2224	2"CS-2220 TO WELL	MP-07	EF-04			Υ					IW-22

AS BUILT RECORD DRAWING





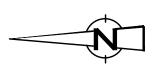
BIOSPARGE TREATMENT SYSTEM

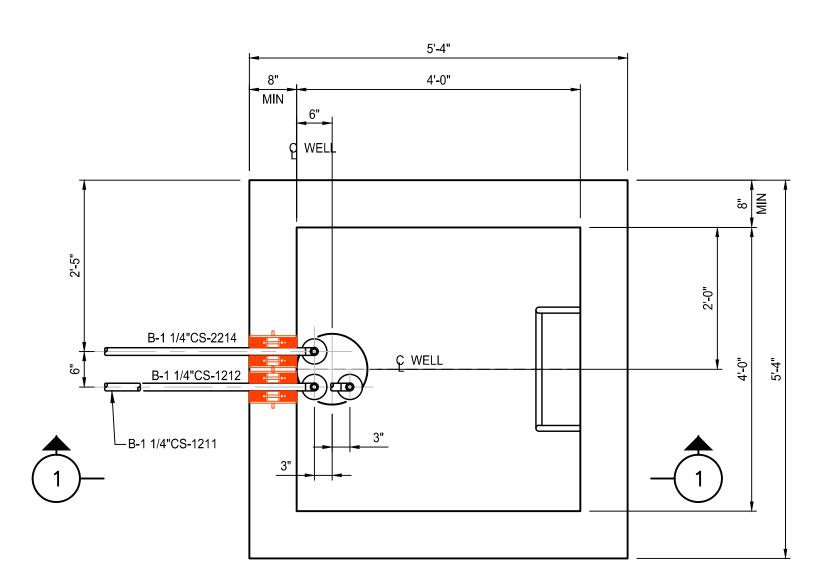
LINE LIST



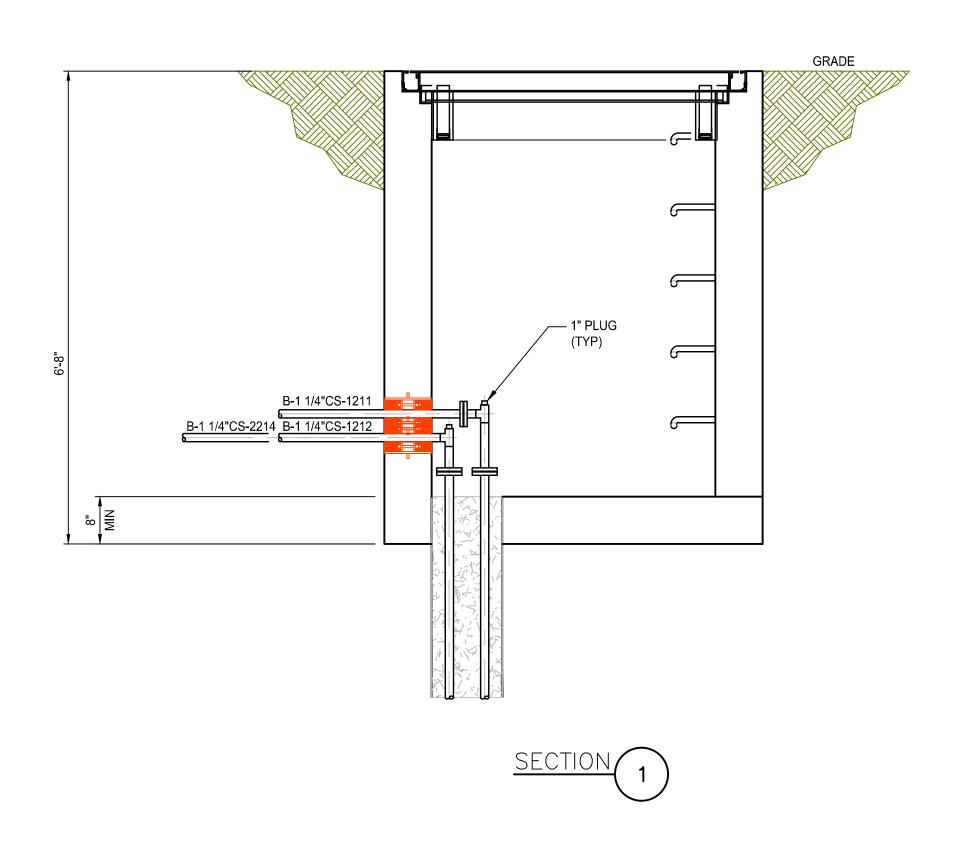
Source Reference:			Date:
			SEPTEMBER 2003
Project Manager:	Reviewed By:	Designed By:	Drawn By:
J. KAY		B. A. BEEBE	B. A. BEEBE
Scale:	Project No:	Report No:	Drawing No:
NONE	06883-00	056	MP-12

06883-00(056)MP-BU012 SEP 26/2012





<u>Plan view</u>



AS BUILT RECORD DRAWING

- 1. WELLS IW-01 THRU IW-07 ARE LOCATED NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE NORTH SIDE OF THE VAULT.
- 2. WELLS IW-15 THRU IW-22 ARE LOCATED JUST NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE SOUTH SIDE OF THE VAULT.

3. ALL AIR, LIQUID, CONTROL	IND ELECTRICAL LINES PASS THRU THE VAULTS, EXCEPT IW-1, IW-8, IW-15, AND IW-22. CONTRACT	OR
PLUGGED ANY ADDITIONAL	HOLES IN THESE VAULTS.	

SCA	LE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. AL	DJUST SCALE ACCOF	RDINGLY.
			ı
1	AS BUILT	08/29/12	LV
No	Revision	Date	Initial

HOOKER/RUCO SITE HICKSVILLE, NEW YORK

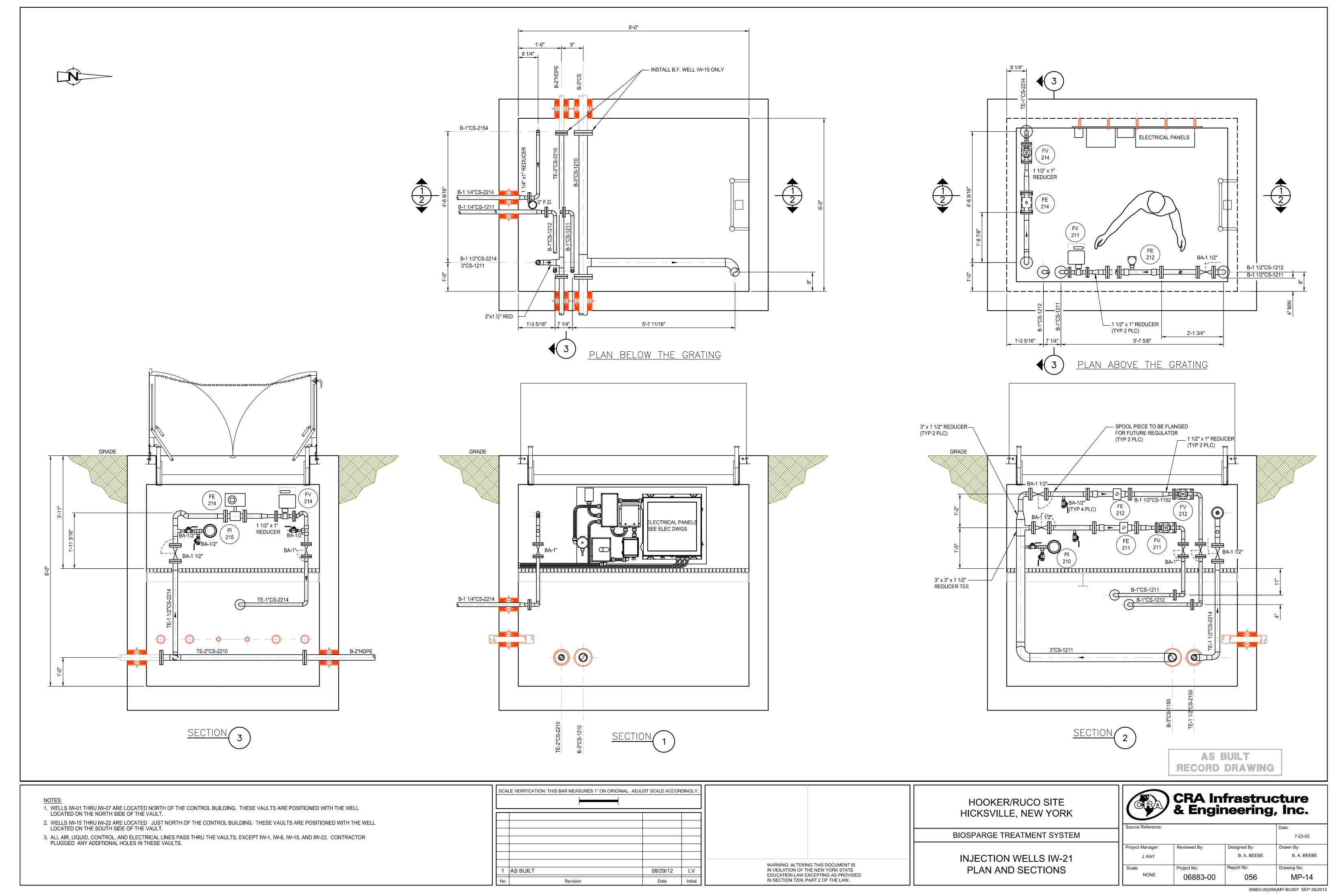
BIOSPARGE TREATMENT SYSTEM

INJECTION WELLS IW-21A PLAN AND SECTIONS



Source Reference:			Date:	
			7-23-03	
Project Manager: J. KAY	Reviewed By:	Designed By: B. A. BEEBE	Drawn By: B. A. BEEBE	
Scale: NONE	Project No: 06883-00	Report No: 056	Drawing No: MP-13	

06883-00(056)MP-BU007 SEP 26/2012



DRAWING INDEX

INJECTION WELL SITE PLAN

INJECTION WELLS IW - 16, 17, 18, 19

MISC. SECTIONS AND DETAILS SECTIONS AND DETAILS

DATE

08/29/12

08/29/12

08/29/12

DWG. Nº REV. Nº

CIVIL / STRUCTURAL

CI-04			
CI-05	1	08/29/12	INJECTION WELLS IW - 1 THROUGH IW-7, AND CH - 8
CI-06	1	08/29/12	INJECTION WELLS IW - 15, 20, 21, 22
ST-01	1	08/29/12	CONTROL BUILDING - GENERAL NOTES
ST-02	1	08/29/12	CONTROL BUILDING - FLOOR PLAN
ST-03	1	08/29/12	CONTROL BUILDING - ELEVATIONS
ST-04	1	08/29/12	CONTROL BUILDING - SECTION AND DETAILS
ST-05	1	08/29/12	CONTROL BUILDING - SCHEDULE & DETAILS
ST-06	1	08/29/12	CONTROL BUILDING - FOUNDATION PLAN
ST-07	1	08/29/12	CONTROL BUILDING - MISCELLANEOUS DETAILS
J. 0.	•		OUTTO DOLLA IN COLLET IN LOGIC DE 17 ILLO
ENGINEERING	FLOW S	HEETS	
EF-00	1	08/29/12	ENGINEERING FLOW SHEET - LEGEND
EF-01 S1	1	08/29/12	ENGINEERING FLOW SHEET - PROCESS EQUIPMENT
EF-01 S2	1	08/29/12	ENGINEERING FLOW SHEET - PROCESS EQUIPMENT
EF-02	1	08/29/12	ENGINEERING FLOW SHEET - MIDDLE FENCE INJECTION WELLS
EF-03	1	08/29/12	ENGINEERING FLOW SHEET - MIDDLE FENCE INJECTION WELLS
EF-04	1	08/29/12	ENGINEERING FLOW SHEET - MIDDLE FENCE INJECTION WELLS
EF-05	1	08/29/12	ENGINEERING FLOW SHEET - MIDDLE FENCE INJECTION WELLS
EF-06	1	08/29/12	ENGINEERING FLOW SHEET - NORTH FENCE INJECTION WELLS
EF-07	1	08/29/12	ENGINEERING FLOW SHEET - NORTH FENCE INJECTION WELLS
EF-08	1	08/29/12	ENGINEERING FLOW SHEET - NORTH FENCE INJECTION WELLS
MECHANICAL	/ PIPING		
MP-01	1	08/29/12	CONTROL BUILDING AND WELL - FIELD PIPING PLAN
MP-02	1	08/29/12	CONTROL BUILDING - EQUIPMENT LAYOUT AT GRADE
MP-03	1	08/29/12	CONTROL BUILDING - EQUIPMENT LAYOUT (UPPER)
MP-04	1	08/29/12	CONTROL BUILDING - EQUIPMENT SECTIONS
MP-05	1	08/29/12	WELL DETAILS
MP-06	1	08/29/12	INJECTION WELLS IW-16, 17, 18 & 19 - PLAN AND SECTIONS
	1	08/29/12	
MP-07			INJECTION WELLS IW-15, 20 AND 22 - PLAN AND SECTIONS
MP-08	1	08/29/12	LAVATORY PLUMBING
MP-09	1	08/29/12	INJECTION WELL IW-08 - PLAN AND SECTIONS
MP-10	1	08/29/12	INJECTION WELLS IW-01 THRU IW-07 - PLAN AND SECTIONS
MP-11			REMOVED
	1	08/29/12	LINE LIST
MP-12		00/29/12	LINE LIGI
	1		
MP-13 MP-14	1	08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE)
MP-12 MP-13 MP-14 <u>ELECTRICAL /</u> E-01	1	08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS
MP-13 MP-14 ELECTRICAL /	1 1 INSTRUM	08/29/12 08/29/12 <u>//ENTATION</u> (N	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE)
MP-13 MP-14 ELECTRICAL / E-01	1 1 INSTRUM 1	08/29/12 08/29/12 //ENTATION (N 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN
MP-13 MP-14 ELECTRICAL / E-01 E-02	1 1 INSTRUM 1 1	08/29/12 08/29/12 //ENTATION (N 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03	1 1 INSTRUM 1 1 1	08/29/12 08/29/12 //ENTATION (N 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04	1 1 INSTRUM 1 1 1 1	08/29/12 08/29/12 MENTATION (N 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06	1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 MENTATION (N 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1	1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 MENTATION (N 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2	1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 MENTATION (N 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08	1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 MENTATION (N 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS
MP-13 MP-14 =-01 =-02 =-03 =-04 =-05 =-06 =-07 SHT. 1 =-07 SHT. 2 =-08 =-08 =-09 =-10	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - IGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT
MP-13 MP-14 =-01 =-02 =-03 =-04 =-05 =-06 =-07 SHT. 1 =-07 SHT. 2 =-08 =-09 =-10 =-11 SHT. 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG INPUT WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 1 E-11 SHT. 2 E-11 SHT. 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG IMPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 1 E-11 SHT. 2 E-11 SHT. 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG IMPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 1 E-11 SHT. 3 E-11 SHT. 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG INPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 1 E-11 SHT. 2 E-11 SHT. 3 E-11 SHT. 3 E-11 SHT. 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING POWER PLAN CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL SYSTEM NETWORK ARCHITECTURE CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG INPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM
MP-13 MP-14 ELECTRICAL / E-01 E-02 E-03 E-04 E-05 E-06 E-07 SHT. 1 E-07 SHT. 2 E-08 E-09 E-10 E-11 SHT. 1 E-11 SHT. 2 E-11 SHT. 3 E-11 SHT. 4 E-11 SHT. 4 E-11 SHT. 4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12 08/29/12	INJECTION WELLS IW-21A - PLAN AND SECTIONS INJECTION WELLS IW-21 - PLAN AND SECTIONS OT INCLUDED - TO BE PROVIDED AT LATER DATE) ELECTRICAL/INSTRUMENTATION SITE PLAN CONTROL BUILDING SINGLE LINE DIAGRAM CONTROL BUILDING - GROUNDING PLAN AND DETAILS CONTROL BUILDING - LIGHTING PLAN AND DETAILS CONTROL BUILDING - PANELBOARD SCHEDULES CONTROL BUILDING MOTOR SCHEMATIC DIAGRAMS CONTROL BUILDING INSTRUMENTATION PLAN AND DETAILS MAIN PLC CONTROL PANEL ARRANGEMENT MAIN PLC CONTROL PANEL WIRING DIAGRAM MAIN PLC CONTROL PANEL ANALOG OUTPUT WIRING DIAGRAM MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM (1 OF 2 MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM (1 OF 2 MAIN PLC CONTROL PANEL DIGITAL INPUT WIRING DIAGRAM (1 OF 2
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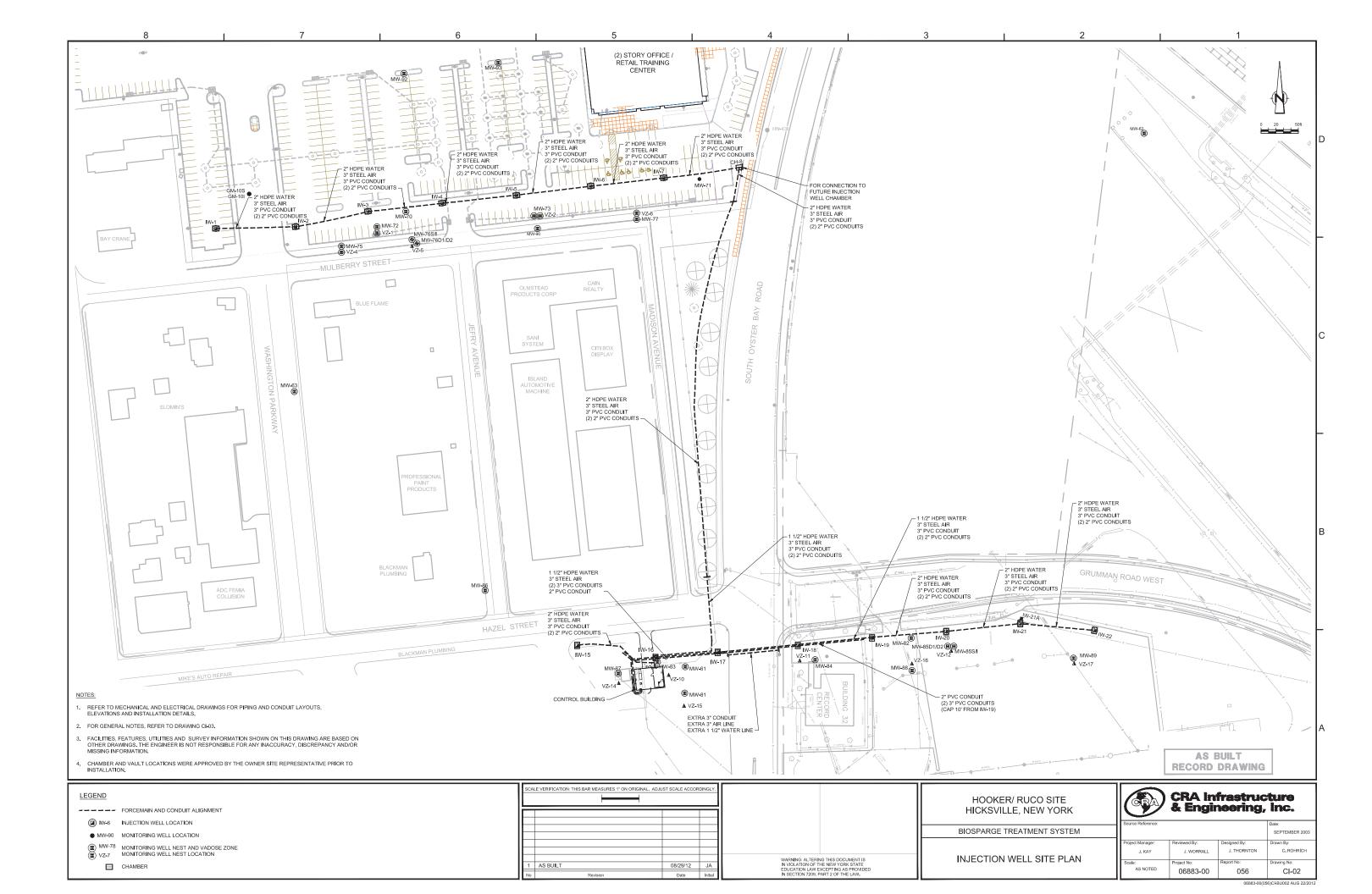
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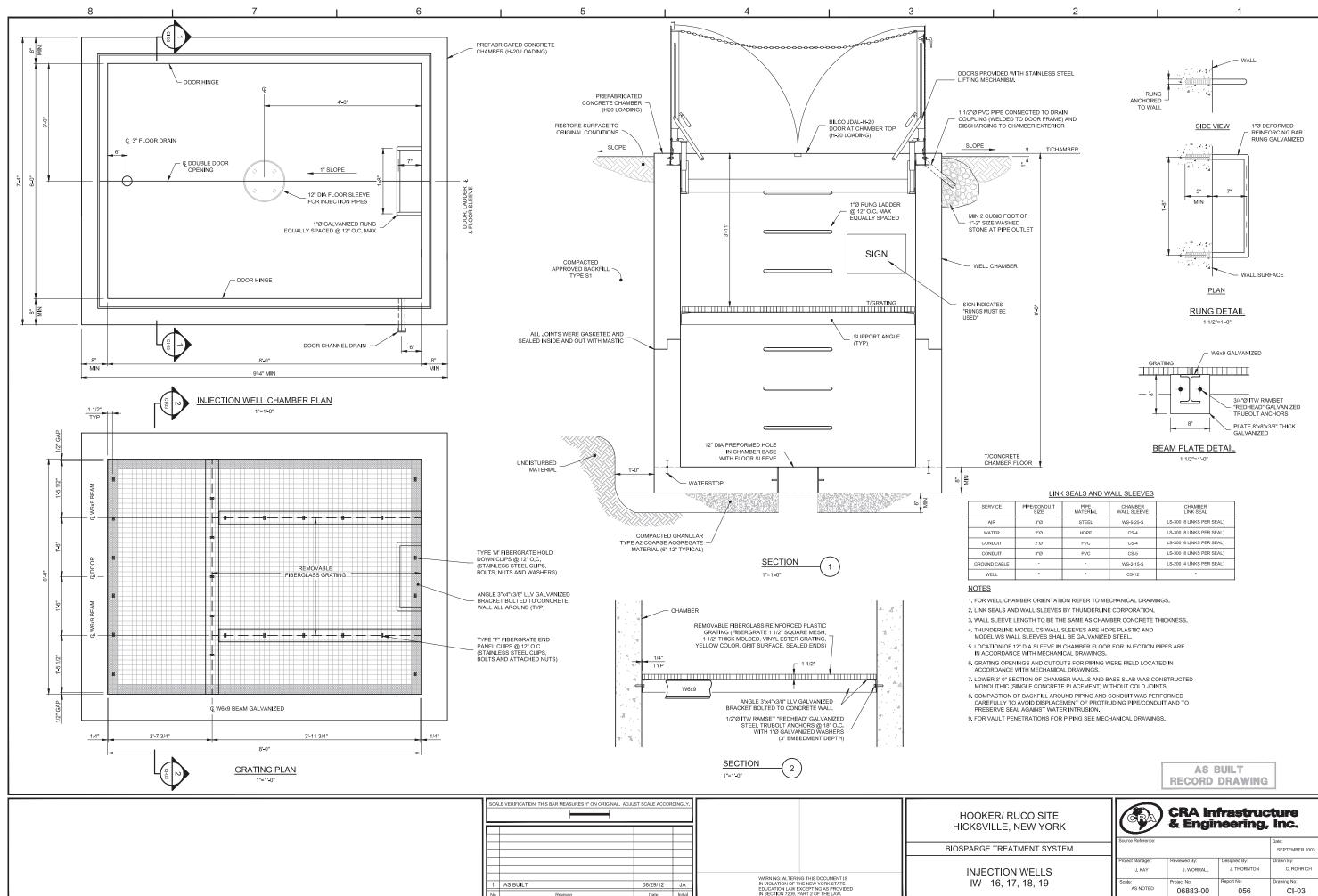
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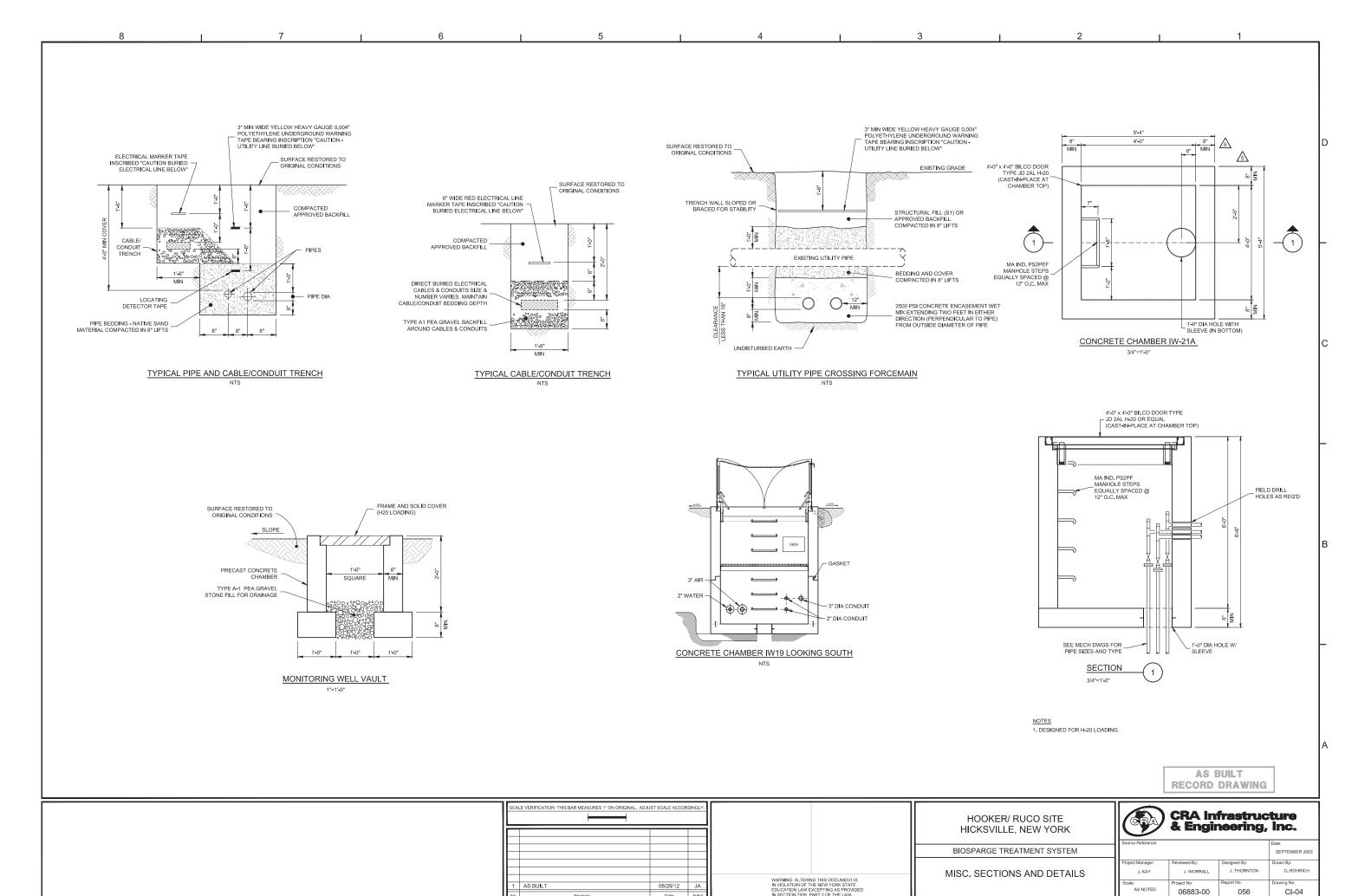
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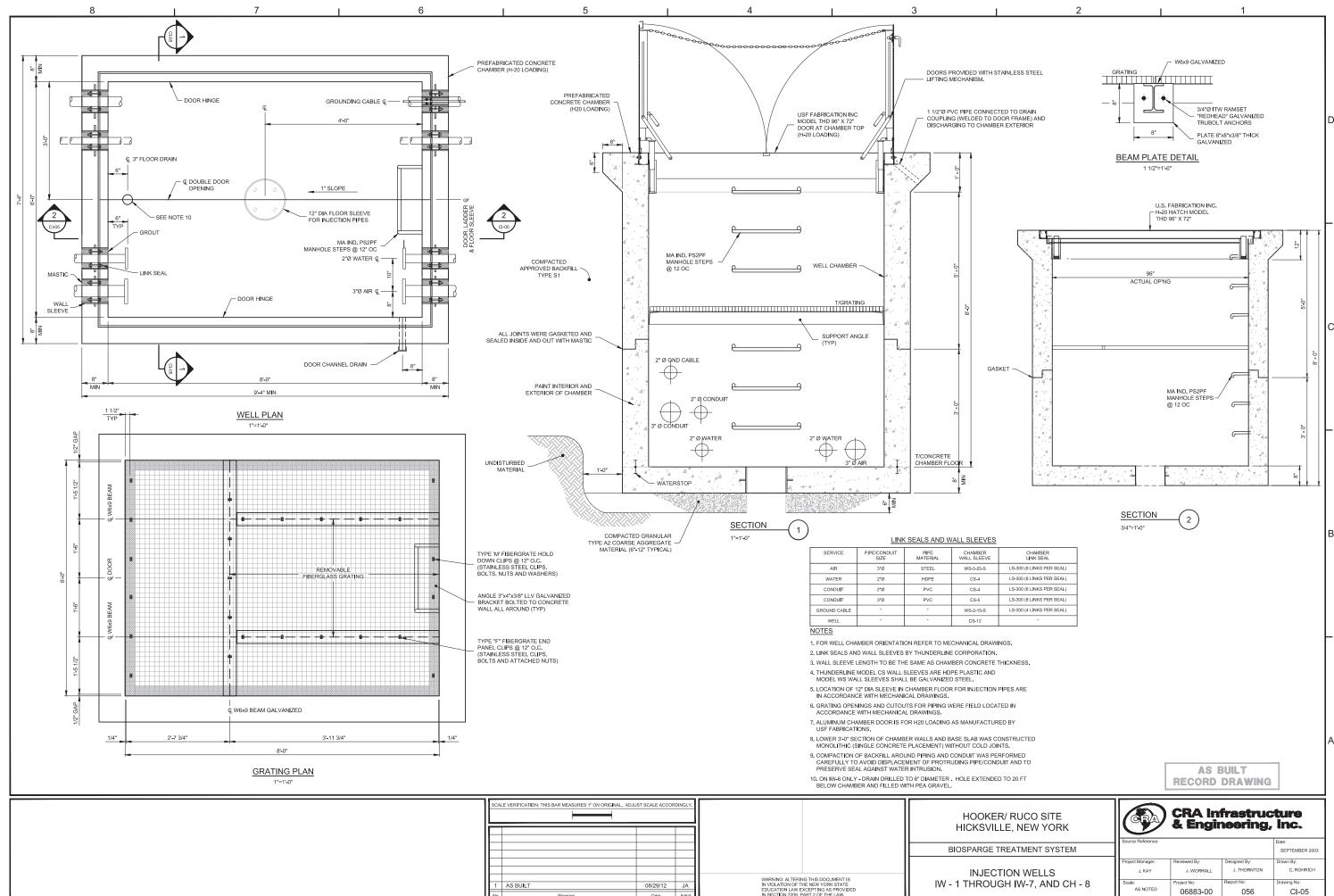




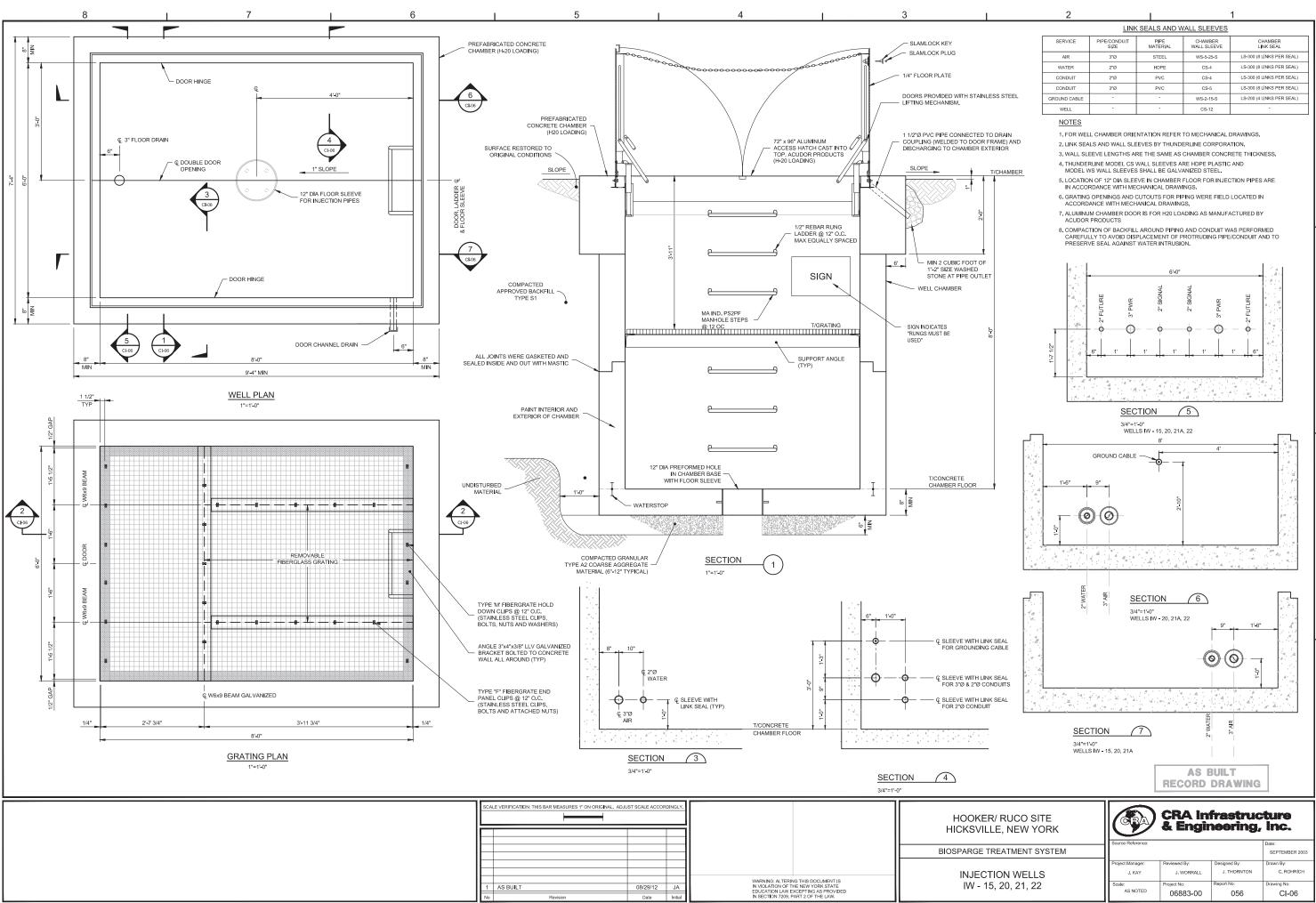
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GENERAL NOTES

- THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS TO ESTABLISH DIMENSIONS. ALL DIMEN-SIONS SHALL BE CHECKED ON-SITE PRIOR TO ASSEMBLY OR CONSTRUCTION OF ANY WORK.
- 2. THE STRUCTURE HAS BEEN DESIGNED FOR THE IN-SERVICE LOADS. THE METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION TO BE USED ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. SUPPORTING FORMWORK FOR CONCRETE CONSTRUCTION SHALL NOT BE REMOVED BEFORE THE CONCRETE HAS GAINED SUFFICIENT STRENGTH TO SAFELY SUPPORT THE DEAD AND SUPERIMPOSED LOADS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID OVERLOADS, AND MAINTAIN AND INSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
- 3. THE CONTRACTOR SHALL REFER TO MECHANICAL & ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SIZE AND LOCATION OF SLEEVES, ANCHORS, INSERTS AND OPENINGS REQUIRED.
- 4. PRINCIPAL OPENINGS IN THE STRUCTURE ARE SHOWN ON THE DRAWINGS, SLEEVES AND OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS SHALL BE SUBJECT TO APPROVAL OF
- 5. MATERIALS SPECIFIED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL BE USED UNLESS THE CONTRACTOR OBTAINS WRITTEN APPROVAL OF THE ENGINEER TO USE ALTERNATIVE MATERIALS. WHEN REQUESTING SUCH APPROVAL, THE CONTRACTOR SHALL PROVIDE A DEQUATE AND DETAILED MANUFACTURER'S LITERATURE AND TECHNICAL DATA FOR EACH MATERIAL PRIOR TO ITS POTENTIAL

CONCRETE NOTES

- 1. CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301, 305, 306, 308, 315, 318 AND 350R
- 2. LATEST REVISION AND/OR VERSION OF ALL CODES AND REFERENCE STANDARDS SHALL BE
- 3. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS. SLUMP SHALL BE 3 1/2 INCHES ± 1 INCH.
- 4. CONCRETE SHALL BE AIR ENTRAINED. CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C 150, TYPE II WITH AIR-ENTRAINING ADMIXTURE CONFORMING TO ASTM C 250, AIR C ONTENT (% BY VOLUME) SHALL NOT BE LESS THAN 4% NOR GREATER THAN 6.5% AND SHALL (SEPEND ON MAXIMUM SIZE AGGREGATE USED.
- 5. NO ADMIXTURE SHALL CONTAIN CALCIUM CHLORIDE BASED COMPOUNDS. FLYASH AND POZZOLAN CONTENT SHALL NOT EXCEED 20% BY WEIGHT OF CEMENT.
- 6 REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS
- 7. LAP SPLICES IN REINFORCING BARS SHALL BE A MINIMUM 38 TIMES BAR DIAMETERS. THE SPLICES SHALL NOT BE LESS THAN 18 INCHES.
- 8. CONCRETE PROTECTION FOR REINFORCING BARS (UNLESS OTHERWISE NOTED):
- A. FOOTINGS 3 INCH BOTTOM AND SIDES, 2 INCH TOP B. GRADE BEAMS 2 INCH BOTTOM AND SIDES, 1 1/2 INCH TOP (TO STIRRUPS)
- B. GRADE BEAMS 2 NICH BOTTOM AND SIDES, 1 1/2 INCH TOP (TI C. PIERS 1 1/2 NICH (TO TIES) D. FORMED SLABS 1 1/2 INCH TOP AND BOTTOM E. WALLS AND PADS 2 INCH F. EXTERIOR SLABS ON FILL 2 1/2 INCH BOTTOM, 2 INCH TOP G. INTERIOR SLABS ON FILL 2 1/2 INCH BOTTOM, 1 1/2 INCH TOP

- ANCHOR BOLTS SHALL BE CARBON STEEL CONFORMING TO ASTM A307 SPECIFICATIONS, WITH HEAVY HEX NUTS AND WASHERS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED CONFORMING TO ASTM A123 AND A153 SPECIFICATIONS, AND SHALL BE ACCURATELY PLACED USING TEMPLATES.
- 10. NO CONSTRUCTION JOINT SHALL BE MADE UNLESS SHOWN ON DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.
- 11. GROUT IN DRILLED HOLES FOR ANCHOR BOLTS AND REINFORCING STEEL DOWELS, AND UNDER BASE PLATES SHALL BE NON-SHRINK NON-METALLIC "MASTERFLOW 713" OR "MASTERFLOW 928" BY DEGUSSA BUILDING SYSTEMS. MANUFACTURER'S INSTRUCTIONS CONCERNING HOLE SIZE, SURFACE PREPARATION AND INSTALLATION SHALL BE FOLLOWED
- 12. EDGE TOOL TOP HORIZONTAL EDGES OF PIERS, EQUIPMENT (PUMP) PADS. OTHER EXPOSED S SHALL HAVE 3/4 INCH CHAMFER.
- 13. RAMPS, PADS AND SLABS SHALL BE TROWEL FINISHED TO WITHIN 1/8 INCH OF ELEVATIONS SHOWN ON DRAWINGS, FOLLOWING TROWELLING, PROVIDE NON-SLIP MEDIUM BROOM FINISH.
- 14. PROVIDE CORNER BARS TO MATCH HORIZONTAL BARS AT ALL EXTERIOR CORNERS.
- 15. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82 AND A185 SPECIFICATIONS.
- 16. PROVIDE MINIMUM OF 6 INCH MECHANICALLY COMPACTED CRUSHED STONE UNDER SLABS AND WHERE OTHERWISE NOTED ON DRAWINGS.
- 17. JOINT SEALANT SHALL BE ONE-COMPONENT POLYURETHANE "SIKAFLEX-1A" BY SIKA
- 18. WATERSTOPS SHALL BE 6 INCH FLAT RIBBED PVC WATERSTOPS R6-316 OR 4 INCH RIBBED CENTER BULB PVC WATERSTOPS RB4-316 BY VINYLEX CORPORATION. WATERSTOPS SHALL BE HEAT FUSED AT ALL JOINTS.
- PERIMETER FOUNDATION WALL RIGID INSULATION SHALL BE STYROFOAM SQUARE EDGE BY DOW CHEMICAL COMPANY; AND LATEX MODIFIED CONCRETE FACING, TONGUE AND GROOVE FORMAT, WITH GALVANIZED CLIPS AND FASTENERS.
- 20. PRIOR TO CASTING CONCRETE PADS AND PIERS, BASE SLAB AND WALL SHALL BE ROUGHENED, CLEANED AND COATED WITH A CONCRETE BONDING AGENT. BONDING AGENT SHALL BE "CONCRESIVE LIQUID (LPL)" OR "CONCRESIVE PASTE (LPL)" BY DEGUSSA BUD SYSTEMS, MANUFACTURER'S INSTRUCTIONS CONCERNING SURFACE PREPARATION AND APPLI-

STRUCTURAL STEEL NOTES

- 1. FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO THE DESIGN DRAWINGS, SCOPE OF WORK AND SPECIFICATIONS, AND SHALL BE IN ACCORDANCE WITH THE AISC SPECIFICATIONS.
- 2. LATEST REVISION AND/OR VERSION OF ALL CODES AND REFERENCE STANDARDS SHALL BE
- 3. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 SPECIFICATIONS. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B WITH YIELD STRESS OF 46 KSI.
- 4. ALL DIMENSIONS SHALL BE FIELD CHECKED BEFORE FABRICATION MAY BEGIN
- 5. WELDING SHALL BE IN ACCORDANCE WITH THE AWS STRUCTURAL WELDING CODE, WELDED VELUIN SPALL BE IN A CADALAVE WITH THE TOOK ELECTRODES, ROOT PASS AND TACK WELDS CONNECTIONS SHALL BE MADE WITH EOTOR ELECTRODES, FILLET WELDS ON STANDARD FRAMED BEAM CONNECTIONS MAY BE 3/16 INCH MINMUM, ALL OTHER FILLET WELDS SHALL BE 1/4 INCH
- 6. GUSSET PLATES AND CLIP ANGLES SHALL BE 5/16 INCH THICK MINIMUM (UNLESS OTHER WISE NOTED). GENERALLY, ONE-SIDED CONNECTIONS FOR BEAMS SHALL NOT BE USED.
- 7. SHOP CONNECTIONS MAY BE EITHER WELDED OR BOLTED. FIELD CONNECTIONS SHALL BE BOLTED (UNLESS OTHERWISE NOTED), CONNECTIONS FOR NEW STEEL FRAMING TO EXISTIN STEEL SHALL HAVE ONE END OF MEMBER BOLTED TO ALLOW FOR ADJUSTMENTS. WELDED CONNECTIONS, FIELD AND SHOP, SHALL BE CONTINUOUS FULL PENETRATION SEAL WELDS.
- 8. FASTENERS SHALL BE HIGH STRENGTH ASTM A325-N, 3/4 INCH DIAMETER GALVANIZED BOLTS WITH ASTM A194 GRADE 2H OR A563 GRADE DH NUTS TAPPED OVERSIZE AFTER GALVANIZING AND THREADS LUBRICATED. HARDENED WASHERS SHALL BE PROVIDED UNDER ROTATING PART OF NUT AND BOLT ASSEMBLY, CONNECTIONS NOTED WITH A325-SC BOLTS SHALL BE SLIP CRITICAL PER AISC SPECIFICATIONS.
- 9. BOLT HOLES SHALL NOT BE LARGER THAN 1/16 INCH PLUS DIAMETER OF THE BOLT. A MINIMUM OF TWO BOLTS PER CONNECTION SHALL BE REQUIRED
- 10. WHERE BRACING FORCES ARE NOT GIVEN, DESIGN CONNECTIONS AT EACH END FOR 50% OF
- 11. ALL STRUCTURAL STEEL FRAMES INCLUDING GIRTS, PURLINS, MISCELLANEOUS STEEL; DOOR/WINDOW/OPENING FRAMES, DOORS, COMBINATION LOUVER/DAMPER AND SHUTTERS SHALL BE PAINTED.
- 12. PAINT SHALL CONSIST OF ONE COAT PRIMER (6 MILS DFT) EPOXY BAR-RUST 235 AND ONE COAT FINISH (2 MILS DFT) ALIPHATIC URETHANE DEVTHANE 379 BY ICI DULUX-DEVOE COATINGS.

FOUNDATION NOTES

- FOUNDATION DESIGN IS BASED UPON A NET ALLOWABLE SOIL BEARING CAPACITY OF 3,000 POUNDS PER SQUARE FOOT FOR FOOTINGS BEARING ON APPROVED NATIVE SUBGRADE SOILS OR COMPACT STRUCTURAL GRANULAR FILL.
- 2. CONTRACTOR SHALL FIELD VERIFY THE FOUNDATION BEARING GRADE MATERIAL AND BEARING CAPACITY DURING CONSTRUCTION. FOUNDATIONS SHALL BE PLACED ON APPROVED BEARING GRADE.
- 3. NO FOOTING SHALL BEAR ON EXISTING FILL, SOFT/LOOSE, ORGANIC OR OTHER UNSUITABLE SOILS, IF ENCOUNTERED, THE EXISTING FILL AND UNSUITABLE SOILS AT THE FOOTING BEARING GRADE LEVEL SHALL BE REMOVED DOWN TO COMPETENT NATIVE SUBGRADE AND EXCAVATION BACKFILLED WITH COMPACTED STRUCTURAL GRANULAR FILL IN ACCORDANCE WITH THE SPECIAL OF THE PROPERTY OF THE
- 4. EXISTING UNDERGROUND PIPING, REINFORCED CONCRETE STRUCTURES, UTILITIES, ELECTRICAL CABLES AND GROUNDING SYSTEMS NOT IDENTIFIED ON THE DRAWINGS MAY EXIST. WHEN UNCOVERED, THE CONTRACTOR MUST REPORT FINDINGS TO THE ENGINEER FOR IDENTIFICATION AND RECOMMENDED ACTION
- 5. BACKFILL AROUND PIPES AND CABLES AS PER SPECIFICATIONS, NO PIPES OR CONDUITS SHALL BE PLACED IN FOOTINGS.
- 6. WHERE PIPES OR CONDUITS RUN PERPENDICULAR TO A FOOTING, STEP THE TOP OF THE FOOTING DOWN TO ALLOW PIPES OR CONDUITS TO RUN OVER TOP OF THE FOOTING, WHERE PIPES OR CONDUITS RUN PARALLEL TO A FOOTING, STEP BOTTOM OF FOOTING DOWN SO THAT A LINE DRAWN BETWEEN THE INVERT OF PIPE OR CONDUIT AND BOTTOM OF FOOTING SHALL NOT EXCEED 30 DEGREES ABOVE THE HORIZONTAL NO PIPING OR CONDUIT SHALL BE ALLOWED TO PASS WITHIN A 30-DEGREE PLANE OF INFLUENCE BELOW AND AWAY FROM FOOTINGS
- 7. MAXIMUM WALL FOOTING STEP SHALL BE 1'-0" VERTICAL SPACED NOT LESS THAN 2'-0"
- 8. BUILDING FOUNDATIONS OVER EXISTING UTILITY LINES SHALL BEAR ONLY ON COMPACTED STRUCTURAL FILL PLACED AFTER REMOVAL OF ALL UNCONTROLLED FILL AND UNSUITABLE SOILS.

ARCHITECTURAL NOTES

- BUILDING SHALL CONSIST OF PRE-ENGINEERED METAL, CLEAR SINGLE SPAN RIGID FRAME WITH STRAIGHT COLUMNS (NON-TAPERED) AND GABLED ROOF BEAMS.
- 2. ROOF SHALL HAVE A 2:12 PITCH.
- 3. ROOF PANELS SHALL BE 24 GAUGE STANDING SEAM STEEL.
- 4. EXTERIOR WALL PANELS SHALL BE 26 GAUGE.
- 5. INTERIOR WALL LINER PANELS SHALL BE 28 GAUGE (STANDARD HEIGHT 8'-3"). 6. BOTTOM OF STEEL BASE PLATE TO BE AT EL. 100'-7". 7. BUILDING SHALL HAVE A 6" HIGH CURB AND 1" GROUT UNDER STEEL BASE PLATES.
- 8. CUTOUTS AND HOLES IN WALL AND ROOF PANELS SHALL BE COMPLETELY SEALED BY MECHANICAL/ELECTRICAL CONTRACTORS WITH FIRE STOP AND WEATHER PROOF MATERIALS AFTER PIPE/DUCT/CABLE INSTALLATIONS
- 9. PAINT FOR CONTROL ROOM GYPSUM BOARD WALL SHALL CONSIST OF ONE COAT PRIMER (1 MIL DFT) ULTRA-HIDE PVA (1030) AND ONE COAT FINISH (2 MILS DFT) ULTRA-HIDE LATEX ENAMEL (1416) BY ICI PAINT STORES,
- 10. FIRE EXTINGUISHERS: CONTROL ROOM - (2 NOS) CLASS C TYPE OTHER AREAS - (1 NO) CLASS ABC TYPE.
- 11. BASED ON USE, BUILDING IS NOT INTENDED TO BE "ACCESSIBLE" PER CODE.

PRECAST CONCRETE NOTES

- 1. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGHT OF 5,000 PSI AT 28 DAYS.
- 2. AIR ENTRAINED CONCRETE:
- A. CONCRETE SHALL BE AIR ENTRAINED
- B. CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II WITH AIR ENTRAINING ADMIXTURE CONFORMING TO ASTM C260. AIR CONTENT (% BY VOLUME) SHALL NOT BE LESS THAN 5% NOR GREATER THAN 7%.
- 3. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.
- 4. LAP SPLICES IN REINFORCING SHALL BE IN ACCORDANCE WITH ACI 318 SPECIFICATIONS. LAP SPLICES SHALL NOT BE LESS THAN 18 INCHES.
- 5. CONCRETE PROTECTION FOR REINFORCING BARS SHALL BE INDUSTRY OR DOT STANDARDS, UNLESS NOTED OTHERWISE.
- 6. DESIGN LOADING TO MEET AASHTO HS-20-44 WITH 30% IMPACT. FOR HYDROSTATIC PRESSURE AND UPLIFT FORCES. WATER TABLE SHALL BE CONSIDERED AT THE GROUND SURFACE.
- 7. LIFTING HOLES IN PRECAST UNITS TO BE FILLED WITH CONCRETE REPAIR MATERIAL IN ACCORDANCE
- PERMIT NOTE

CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM CITY AND STATE AGENCIES FOR UTILITIES AND ROAD PAVEMENT INCLUDING RIGH-OF-WAY WORK.

AS BUILT RECORD DRAWING

CALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDING 08/29/12 ZM AS BUILT

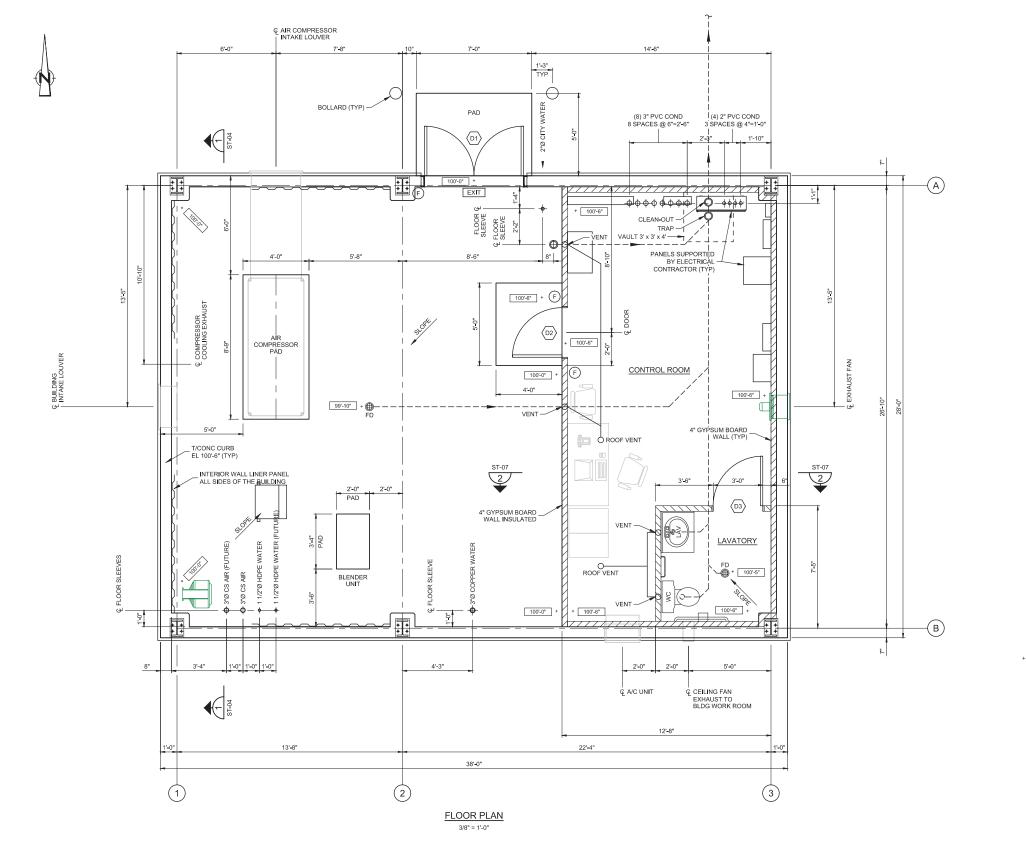
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING **GENERAL NOTES**



AUGUST 2012 SKM ZM NONE 06883-00 056 ST-01



BUILDING CODE DATA

CODE:
LOCATION:
BUILDING DIMENSIONS:
BUILDING HEIGHT:
BUILDING AREA:
OCCUPANCY CLASS:
CONSTRUCTION:
OCCUPANT LOAD:
BUILDING TYPE:
BUILDING INSULATION:
FIRE RESISTANCE RATING:

FIRE SEPARATION ASSEMBLIES:

BUILDING CODE OF NEW YORK STATE
TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK
28°-0" × 38°-0" ONE STORY
14'-6" NOMINAL EAVE - ABOVE FLOOR
1,064 SQUARE FEET (TABLE 503)
USE GROUP F-2 FACTORY INDUSTRIAL (SECTION 306.3)
NON-COMBUSTIBLE TYPE 2B (SECTION 602.2, TABLE 601)
ACTUAL - NONE; TABLE - 10 PERSONS (SECTION 1003.2.2.2)
PRE-ENGINEERED METAL, STRUCTURAL STEEL RIGID FRAMED
WALLS - R19, ROOF - R30
GREATER THAN 30 FEET
EXTERIOR WALL - 0 HR (TABLES 601 & 602)
NOT REQUIRED (TABLE 302.3.3)

STRUCTURAL LOADS (NON-FACTORED)

1. DEAD LOAD

FLOOR LIVE LOAD
 UNIFORMLY DISTRIBUTED LOAD
 CONCENTRATED LOAD

3. ROOF LIVE LOAD

0 - 200 SQUARE FEET TRIBUTARY AREA 201 - 600 SQUARE FEET TRIBUTARY AREA OVER 600 SQUARE FEET TRIBUTARY AREA CONCENTRATED LOAD

4. ROOF SNOW LOAD

GROUND SNOW LOAD SNOW EXPOSURE FACTOR SNOW LOAD IMPORTANCE FACTOR

5. WIND LOAD

BASIC WIND SPEED (3-SECOND GUST) EXPOSURE CATEGORY WIND LOAD IMPORTANCE FACTOR

6. EARTHQUAKE LOAD

SEISMIC USE GROUP SEISMIC IMPORTANCE FACTOR SITE CLASS

7. SPECIAL LOADS

COLLATERAL IMPOSED CEILING LOAD PIPE/CABLE & EQUIPMENT LOADS

FLOOD LOAD UNIT HEATER AIR CONDITIONER

8. <u>DEFLECTION LIMITATION</u>

EXTERIOR WALL AND ROOF SYSTEMS

9. FOUNDATION

NET ALLOWABLE SOIL BEARING PRESSURE MODULUS OF SUBGRADE REACTION STRUCTURAL, NONSTRUCTURAL, EQUIPMENT, PIPE, CABLE

125 POUNDS PER SQUARE FOOT 2,000 POUNDS (ON 2 1/2 FT x 2 1/2 FT SQUARE AREA)

20 POUNDS PER SQUARE FOOT 16 POUNDS PER SQUARE FOOT 12 POUNDS PER SQUARE FOOT

200 POUNDS (ON AREA OF ONE SQUARE INCH)

45 POUNDS PER SQUARE FOOT (FIGURE 1608.2) 0.9 (TABLE 1608.3.1) 1.0 (SECTION 1604.5)

120 MILES PER HOUR (FIGURE 1609) C (SECTION 1609.4)

1.0 (SECTION 1604.5)

GROUP I (SECTION 1616.2) 1.0 (SECTION 1604.5) D (SECTION 1615.1.1)

10 POUNDS PER SQUARE FOOT REFER DRAWINGS NONE 250 POUNDS EACH 500 POUNDS

NOT TO EXCEED 1/240 OF SPAN OF STRUCTURAL MEMBER

3,000 POUNDS PER SQUARE FOOT 200 KIPS PER CUBIC FOOT

LEGEND

+ 100'-0" ELEVATION FEET AMSL

EXIT EXIT SIGN INSTALLED ABOVE DOOR

F FIRE EXTINGUISHER

D1 DOOR

DIRECTION OF FLOOR SLOPE

UNIT HEATER

WALL INTERIOR PANEL

GYPSUM BOARD WALL (FIRE-RATED)

FD FLOOR DRAIN

AS BUILT RECORD DRAWING

NOTES

 ELECTRICAL CONTRACTOR SHALL INSTALL CONDUITS IN CONTROL ROOM FLOOR SLAB AREA PRIOR TO SLAB CONSTRUCTION.

2. CONTRACTOR SHALL INSTALL FLOOR SLEEVES FOR PIPING PRIOR TO SLAB CONSTRUCTION.

3. REFER MECHANICAL DRAWINGS FOR PLUMBING.

4. FLOOR DRAIN SHALL BE FD-2330-PV3 HEAVY DUTY WITH SEDIMENT BASKET BY ZURN (TEL. (716) 665-1131, WWW.ZURN,COM).

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No	Revision	Date	Initial	IN SE

Approved

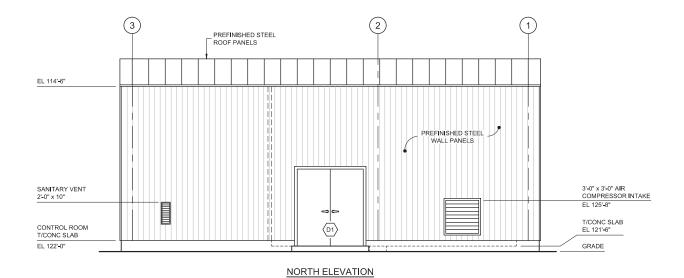
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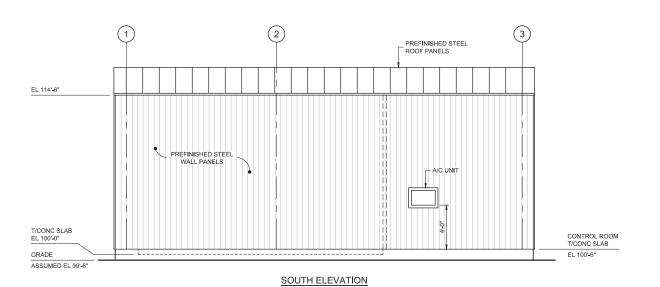
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

BIOSPARGE TREATMENT SYSTEM

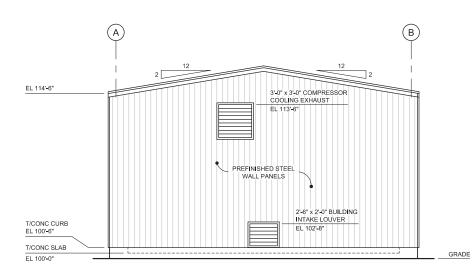
CONTROL BUILDING FLOOR PLAN



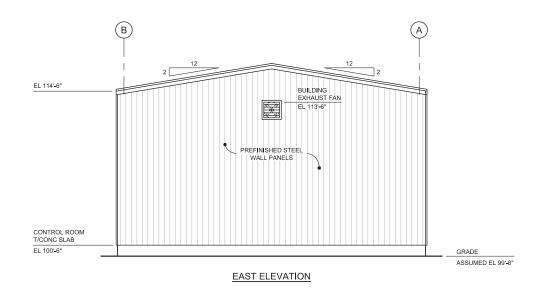




CONTRACTOR SHALL PROVIDE BUILDING EXTERIOR ELEVATION OF 114'-6" AND INTERIOR CLEARANCE AT PRIMARY RIGID FRAME OF MINIMUM 12'-8" ABOVE FLOOR SLAB EL 100'-0", WHICHEVER RESULTS IN GREATER BUILDING HEIGHT



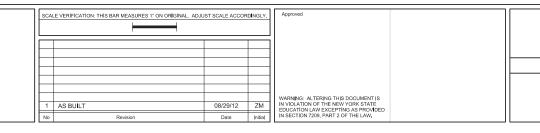
WEST ELEVATION



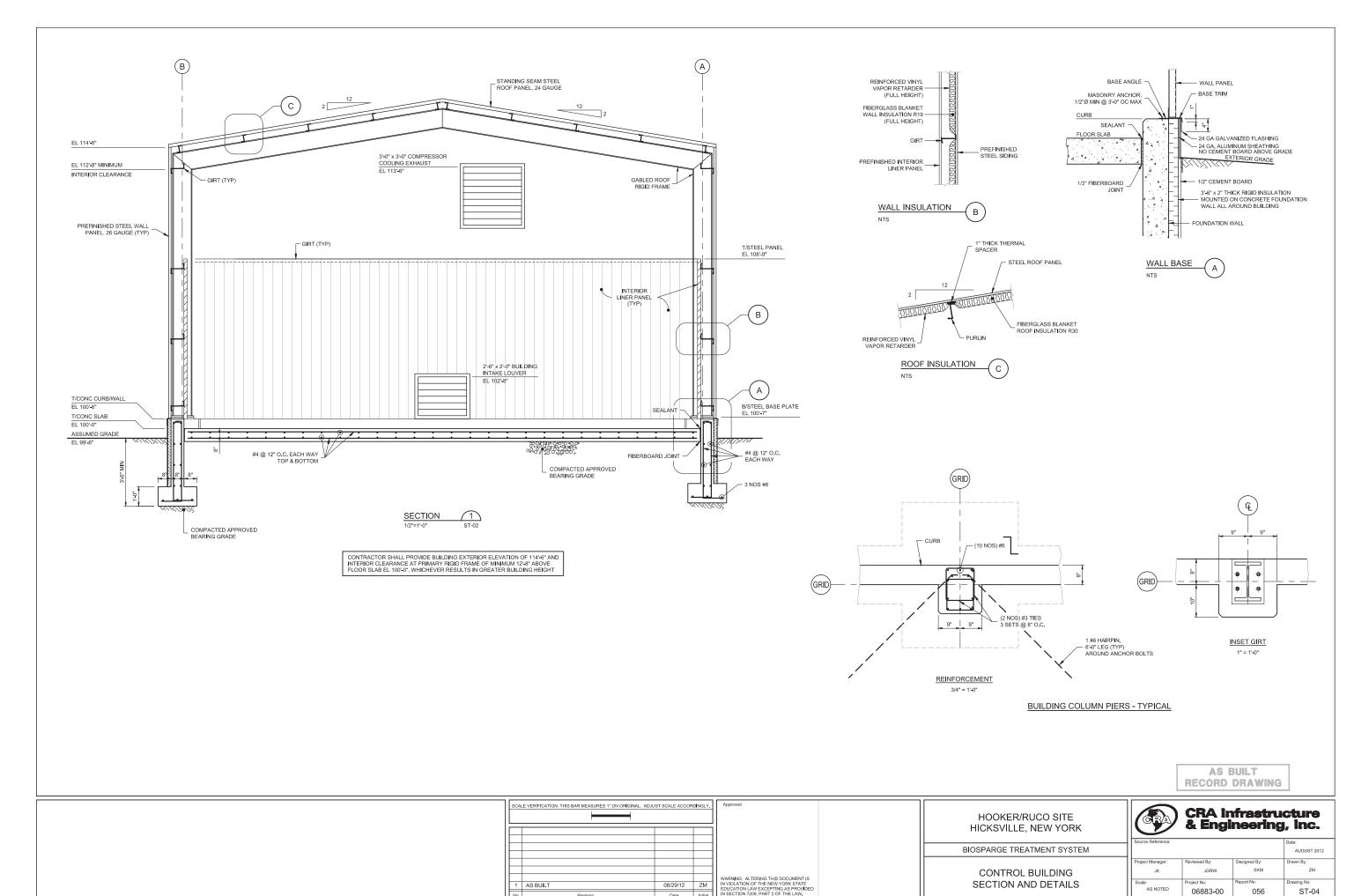
HOOKER/RUCO SITE HICKSVILLE, NEW YORK BIOSPARGE TREATMENT SYSTEM CONTROL BUILDING

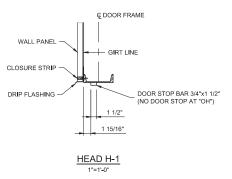
ELEVATIONS

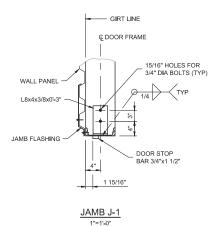
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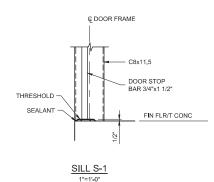


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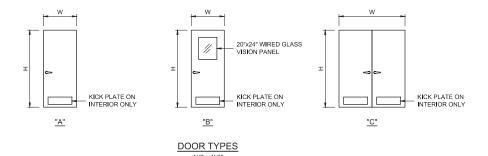








DOOR & HARDWARE SCHEDULE ABBREVIATIONS: SFT 1/4" SAFETY GLASS - STEEL WIRED SS STAINLESS STEEL STL STRUCTURAL STEEL FRP ALUMINUM ENAMEL FRP FIBERGLASS REINFORCED PLASTIC GHM GALVANIZED HOLLOW METAL RBR RUBBER EXTERIOR HARDWARE DOOR FRAME DOOR OPENING REMARKS DOOR LHRB DOOR - DEAD BOLT T & B, RHRB DOOR - LATCHES & EXIT DEVICE (D1) "C" R14.97 6'-0" 7'-0" 1 3/4" STL (D2) 7'-0" "B" D3 INTERIOR LATCH "A" 3'-0" 7'-0" 1 3/4" GHM STL RHRB



DOOR AND HARDWARE NOTE

ALL DOORS AND HARDWARE SHALL BE AS SPECIFIED OR APPROVED EQUAL, AND SHALL CONFORM TO CODE REQUIREMENTS FOR ACCESSIBILITY.

- EXTERIOR DOORS SHALL BE "IMPERIAL" BY CECO DOOR PRODUCTS, 16 GAUGE, POLYURETHANE CORE, GALVANIZED AND PAINTED.
 INTERIOR DOORS SHALL BE "REGENT" BY CECO DOOR PRODUCTS, 18 GAUGE, HONEYCOMB CORE, GALVANIZED AND PAINTED.

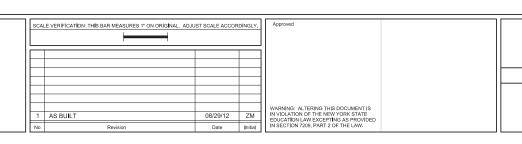
HARDWARE (MANUFACTURER'S STANDARD)

- 1. CLOSER: 1250 SERIES ALUMINUM ENAMEL (EN) "SARGENT".
- 2. DOOR STOP: TRI BASE FLOOR STOP #259F-US26D "HAGER".
- 3. HINGES: FULL MORTISE STAINLESS STEEL 32D, 4 1/2"x4 1/2"x0.134 GAUGE, #BB1191 "HAGER".
 4. KICK PLATE: STAINLESS STEEL 32D, 16 GAUGE, 8"x26", #220S "HAGER".

- 4. KUCK PLATE: STANNESS STEEL 329, 3 ST. STANDERS STEEL 320, 3 ST. SARGENT"; EXTERIOR DOOR BY BUTLER.
 B. PUSH PLATE: STAINLESS STEEL 32D, 3 "x12", #30S "HAGER".
 C. PULL PLATE: STAINLESS STEEL 32D, 3 "x12", #32G "HAGER".
 D. LOCKS: MORTISE "SARGENT".

- C. THRESHOLD:
 A. SKID RESISTANT ABRASIVE CAST ALUMINUM HEAVY DUTY, 4" WIDE, #624S "HAGER".
 B. NON-SLIP ABRASIVE ALUMINUM SADDLE, 4" WIDE, #410S "HAGER".
- 7. WEATHERSTRIP AND DOOR BOTTOM:
 A. WEATHERSTRIP JAMB & HEAD #870S-N "HAGER".
 B. DOOR BOTTOM #774S-V "HAGER".

AS BUILT RECORD DRAWING



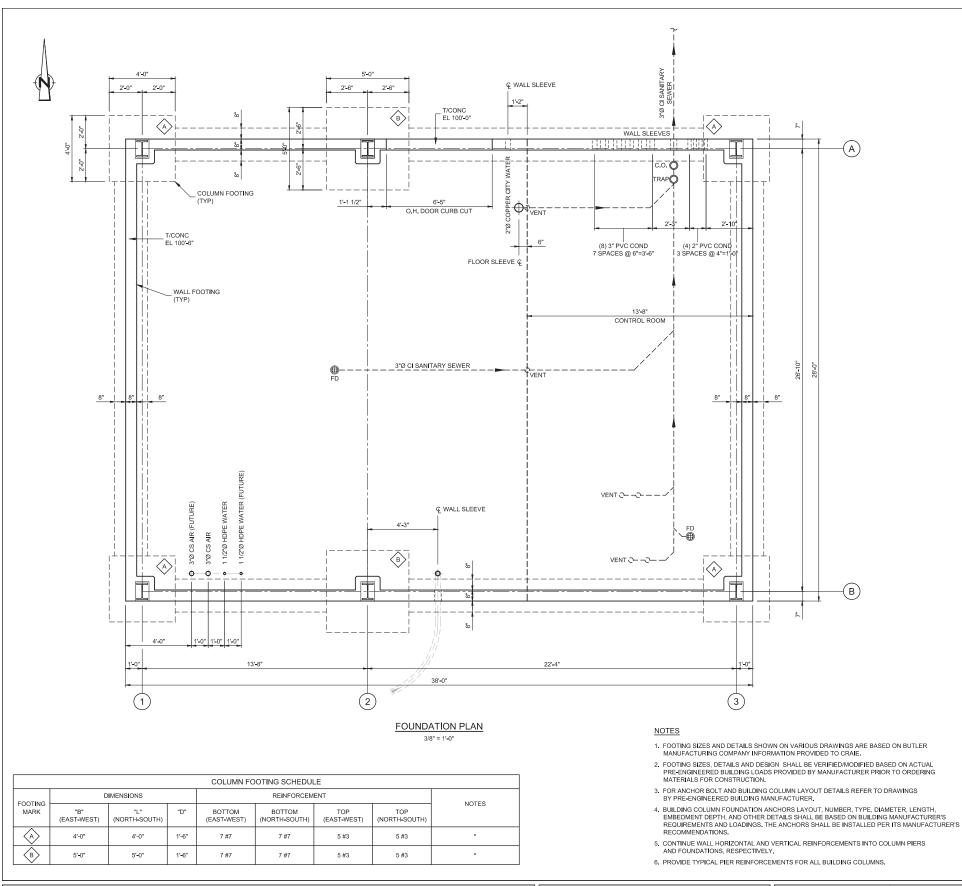
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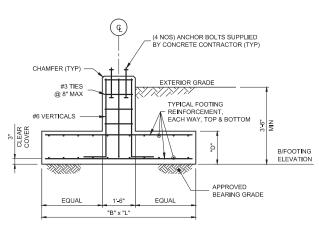
BIOSPARGE TREATMENT SYSTEM

CONTROL BUILDING SCHEDULE & DETAILS

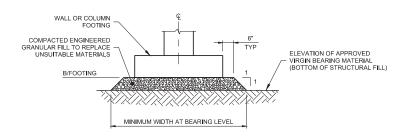


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	Project Manager: JK	Reviewed By: JGRW	Designed By: SKM	Drawn By: ZM	
	Scale: AS NOTED	Project No: 06883-00	Report No: 056	Drawing No: ST-05	

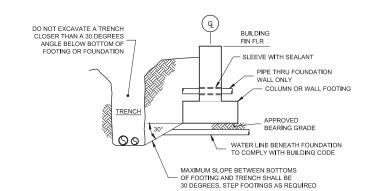




COLUMN FOOTING DETAIL



FILL BENEATH FOUNDATION



TRENCH NEAR FOOTING

NTS

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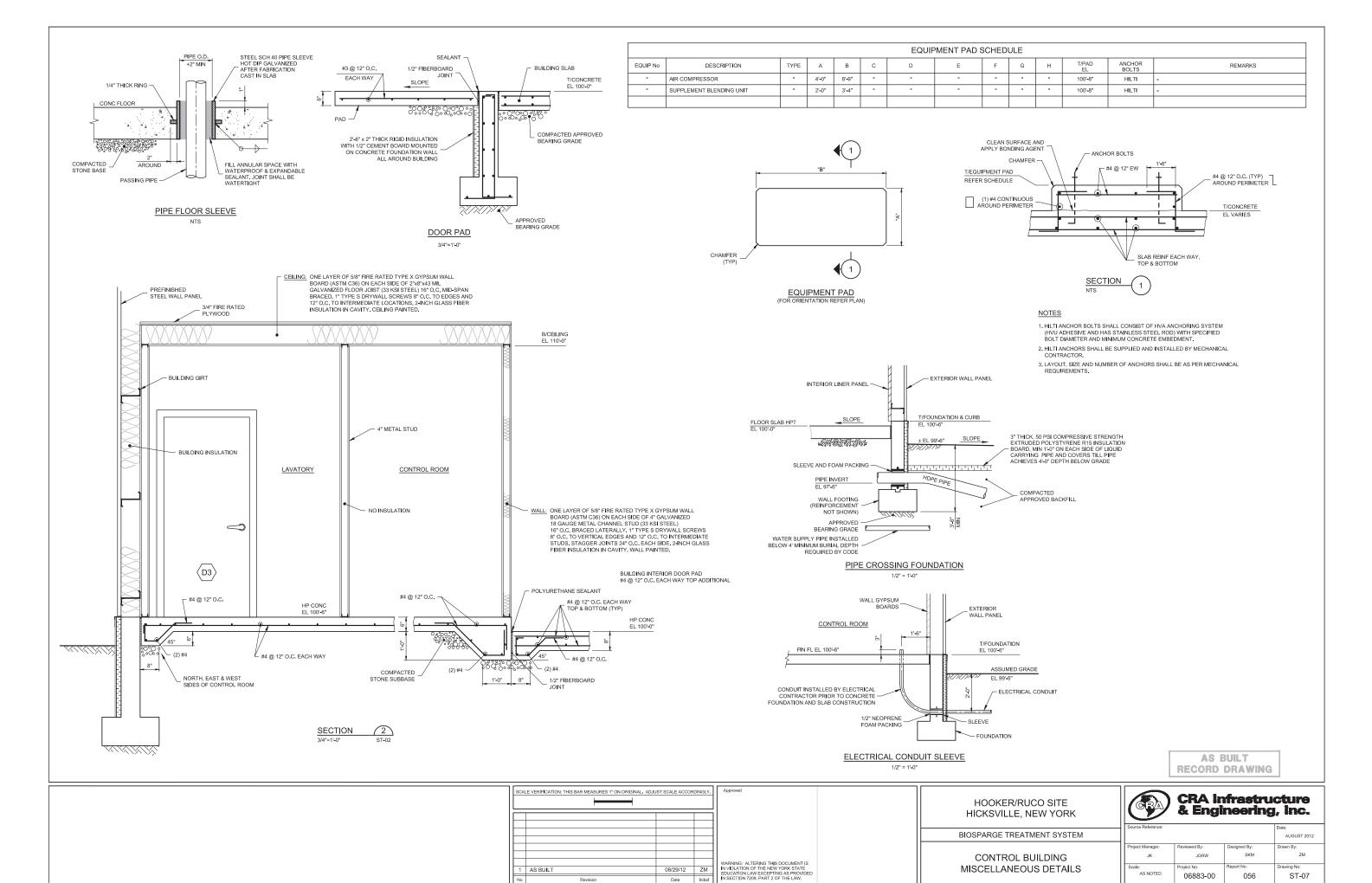
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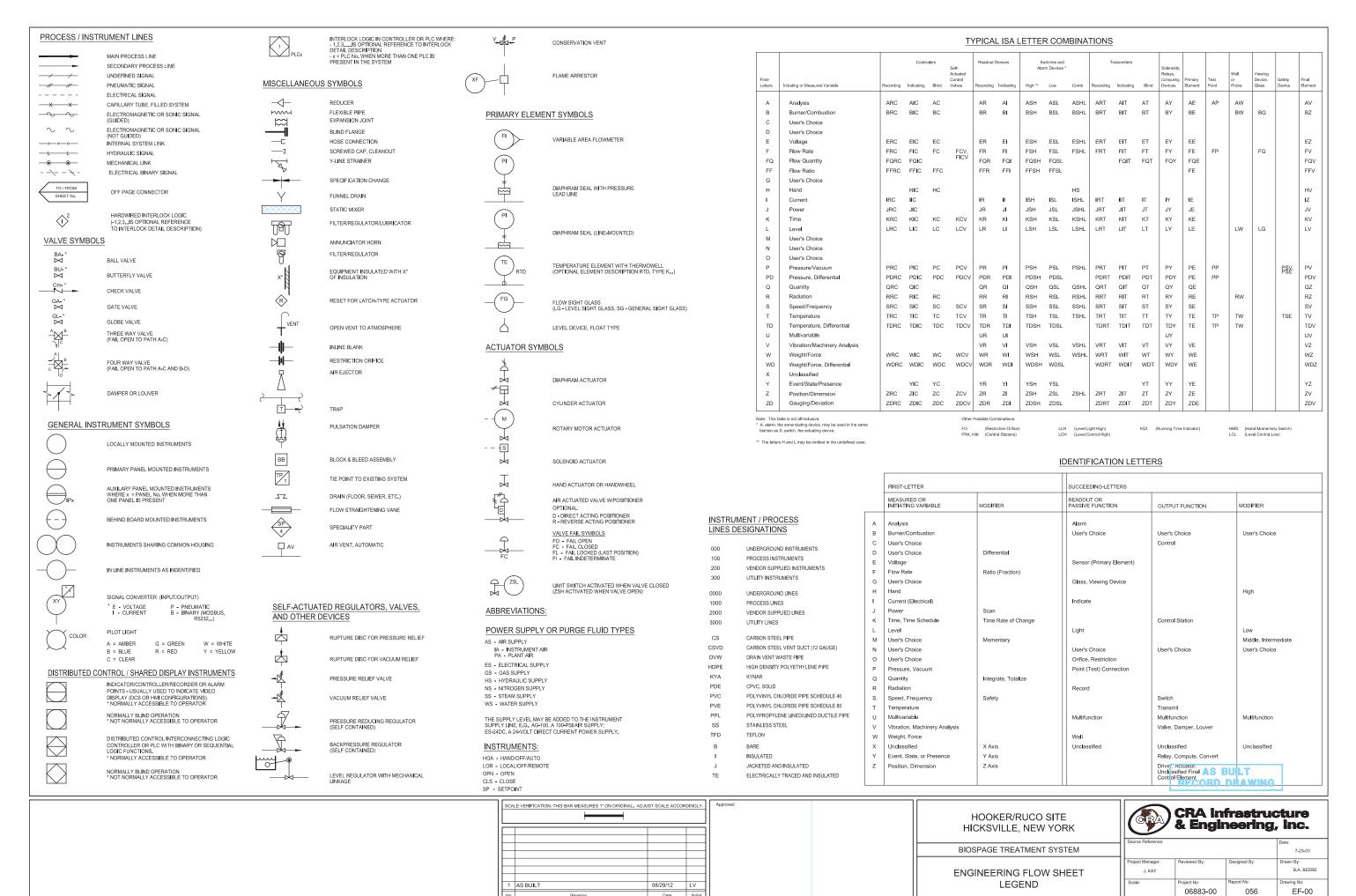
BIOSPARGE TREATMENT SYSTEM

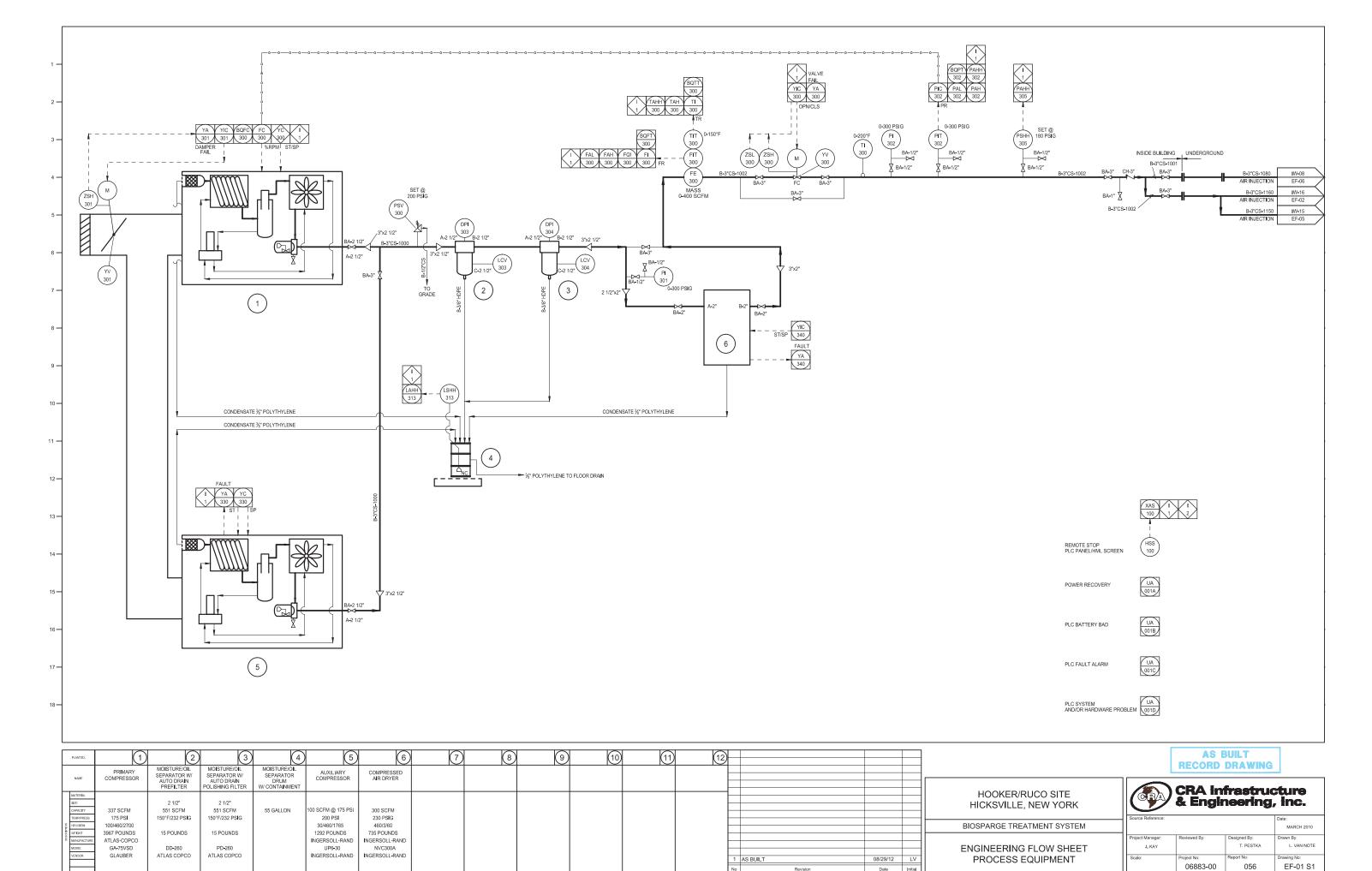
CONTROL BUILDING FOUNDATION PLAN

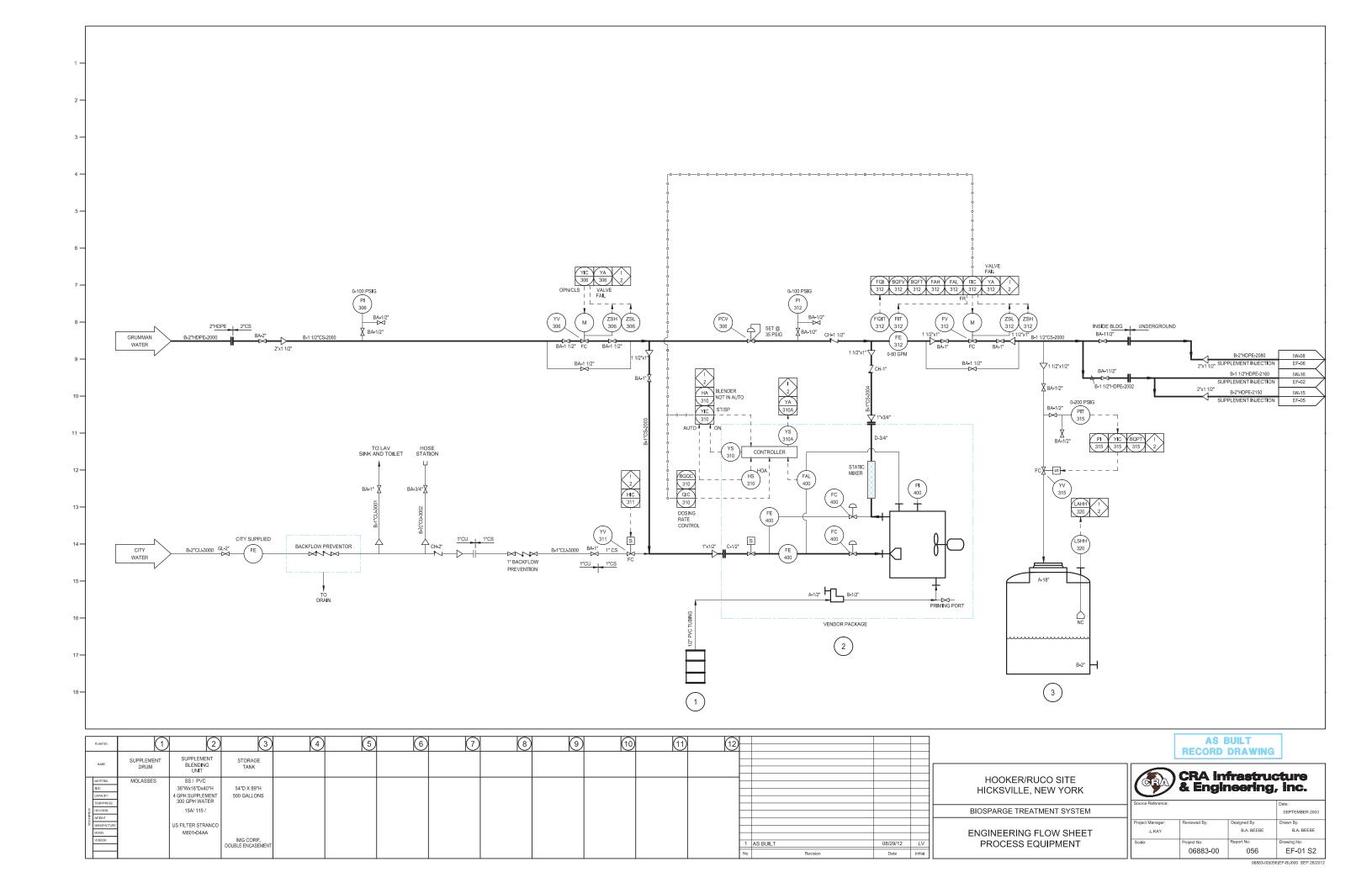


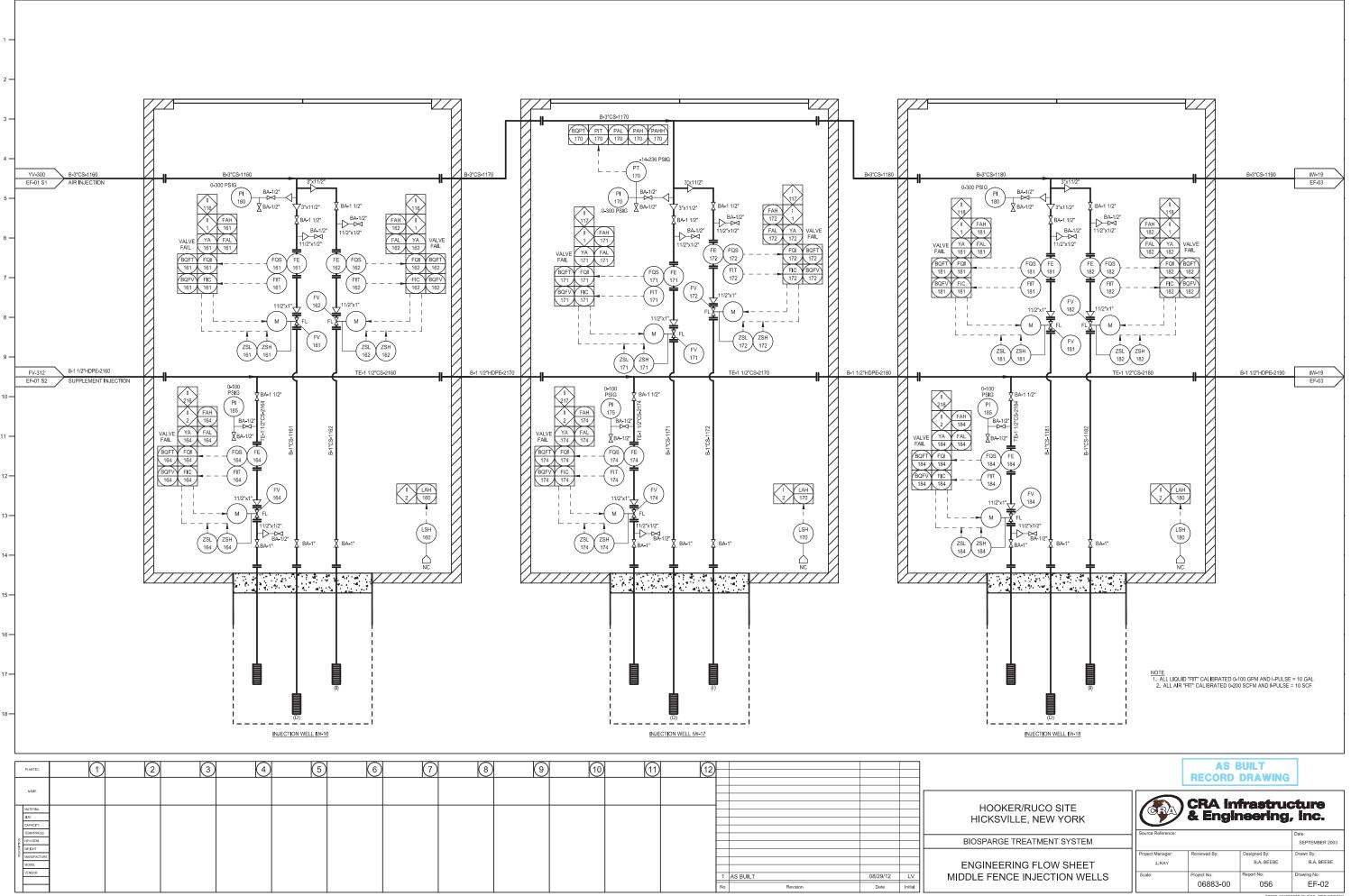
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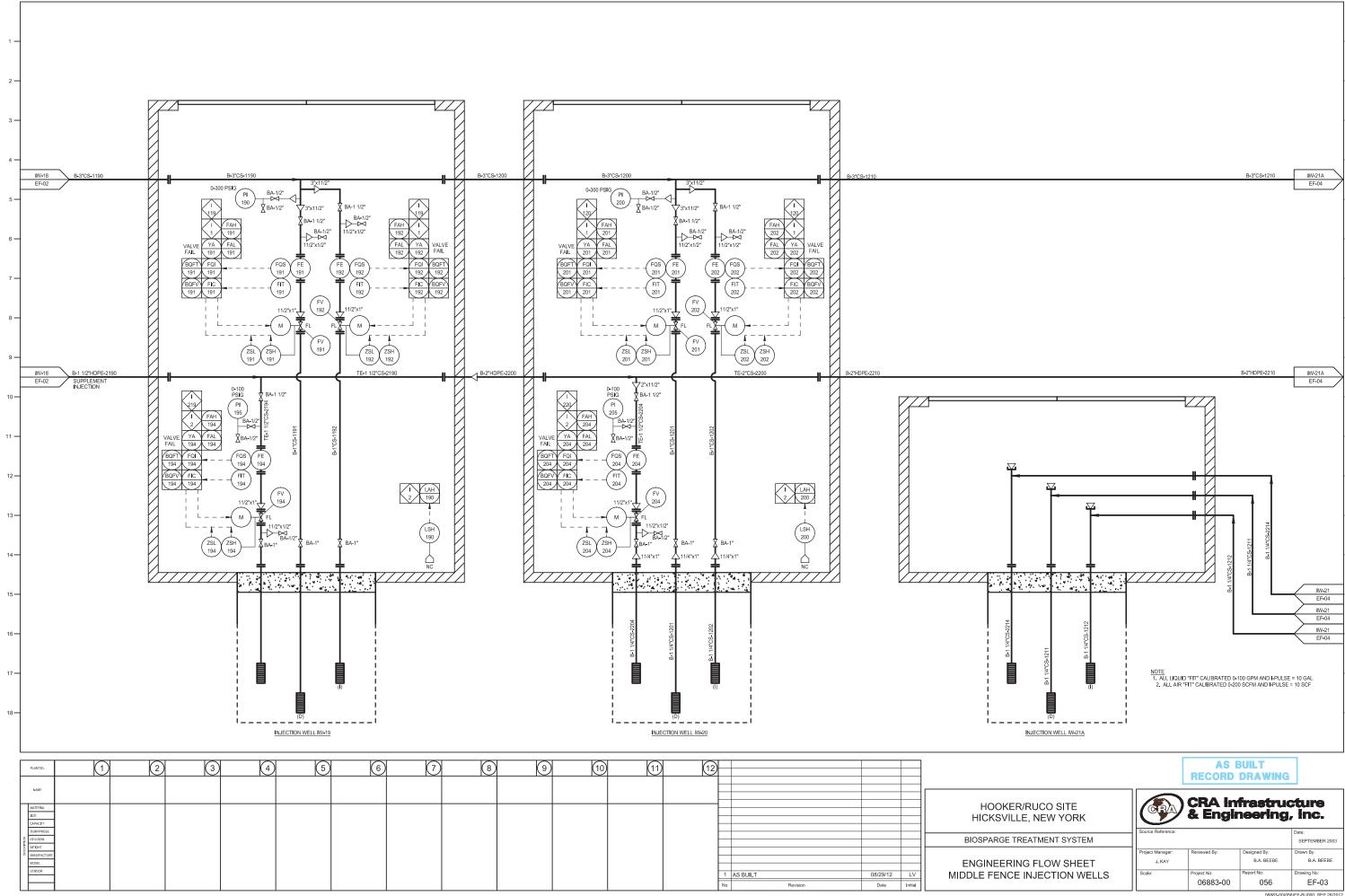


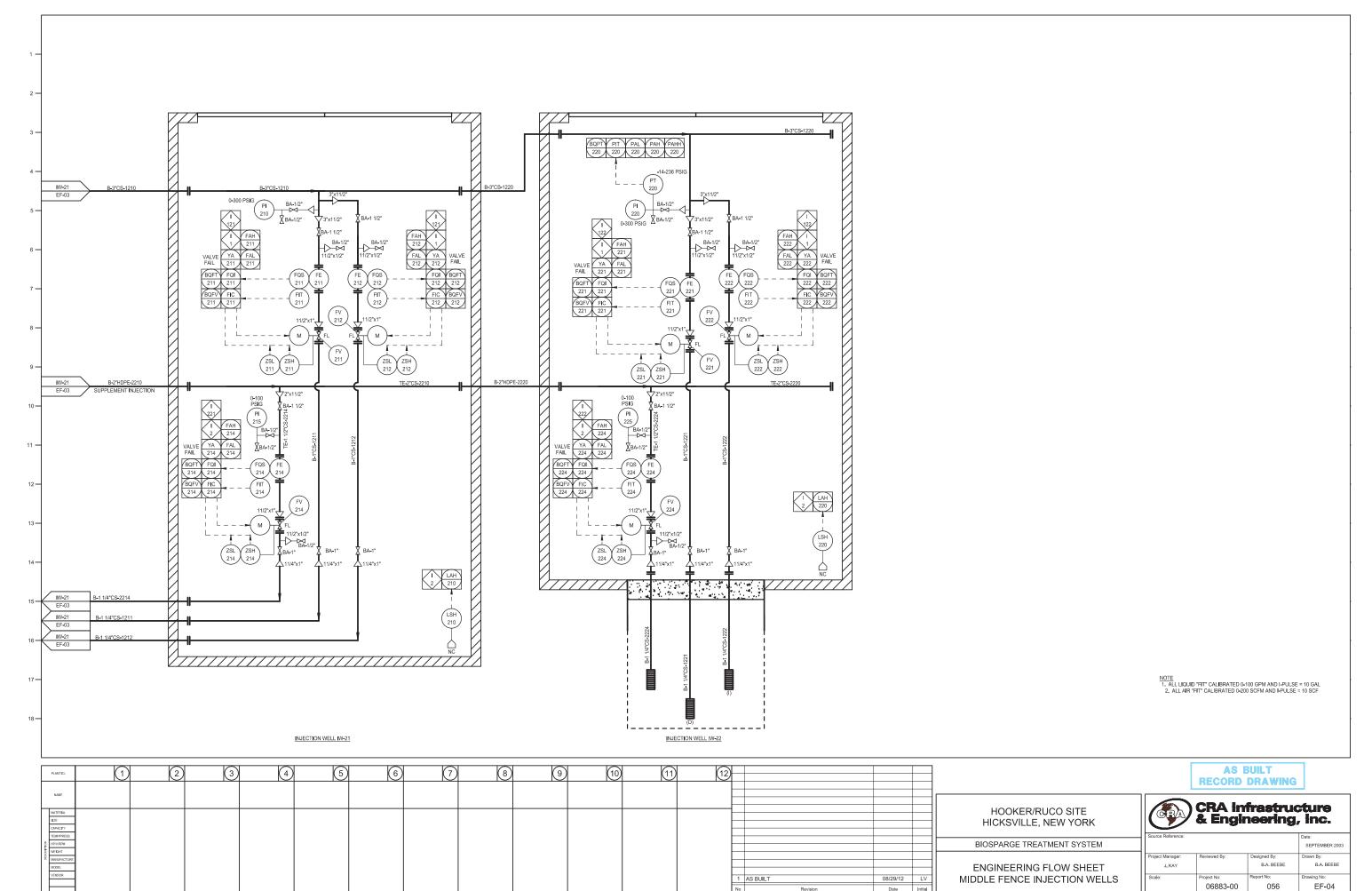




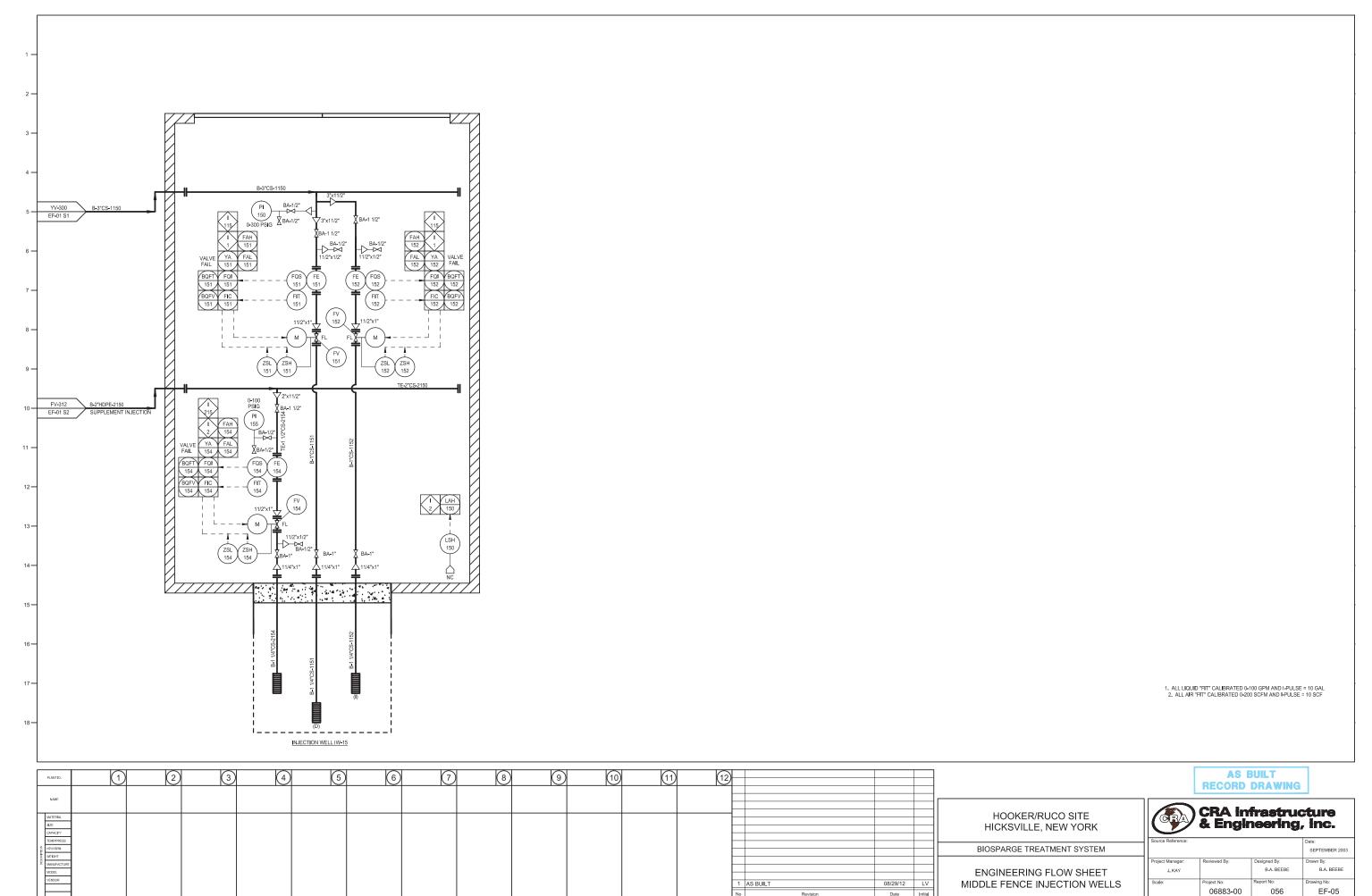




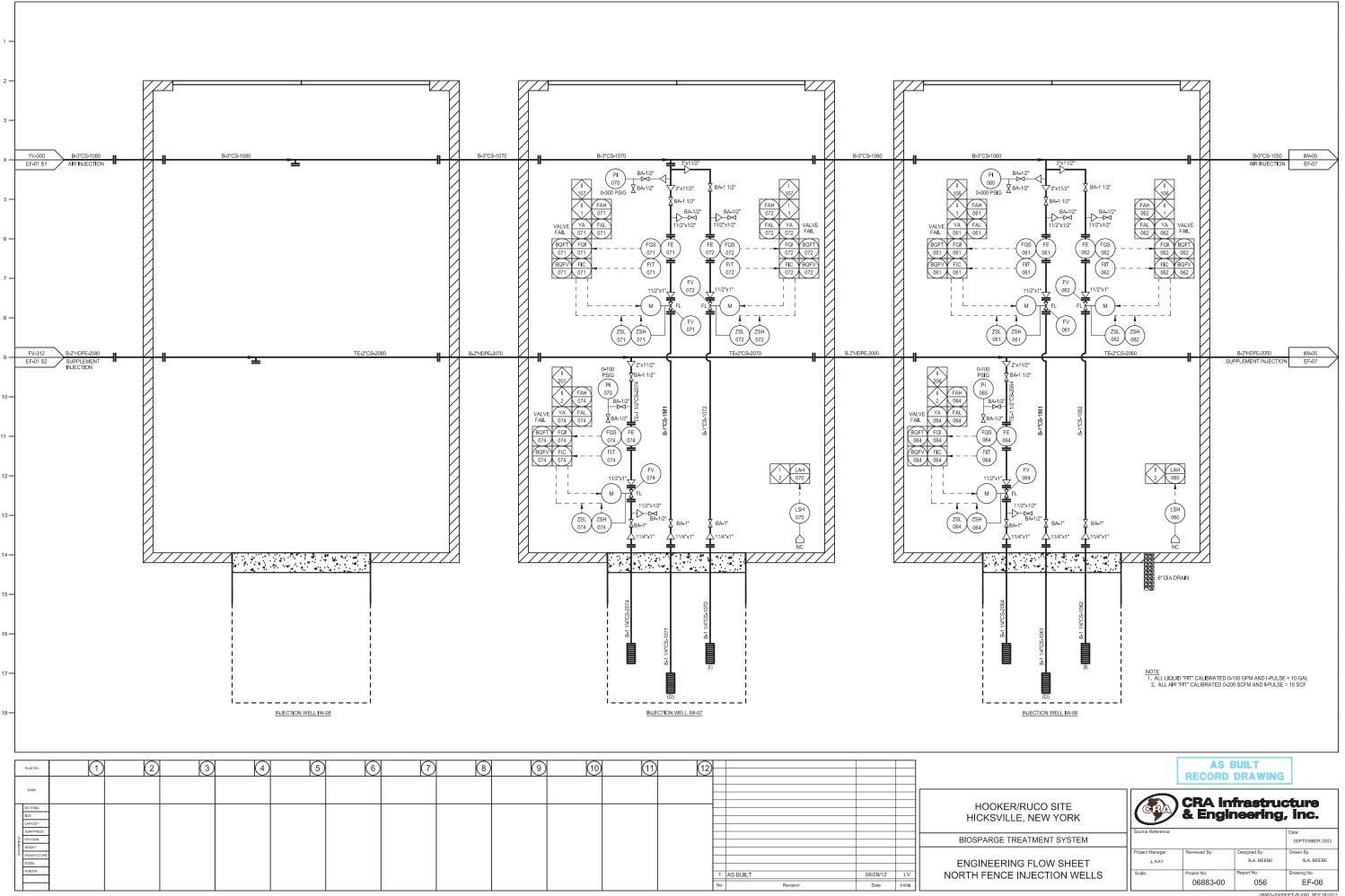


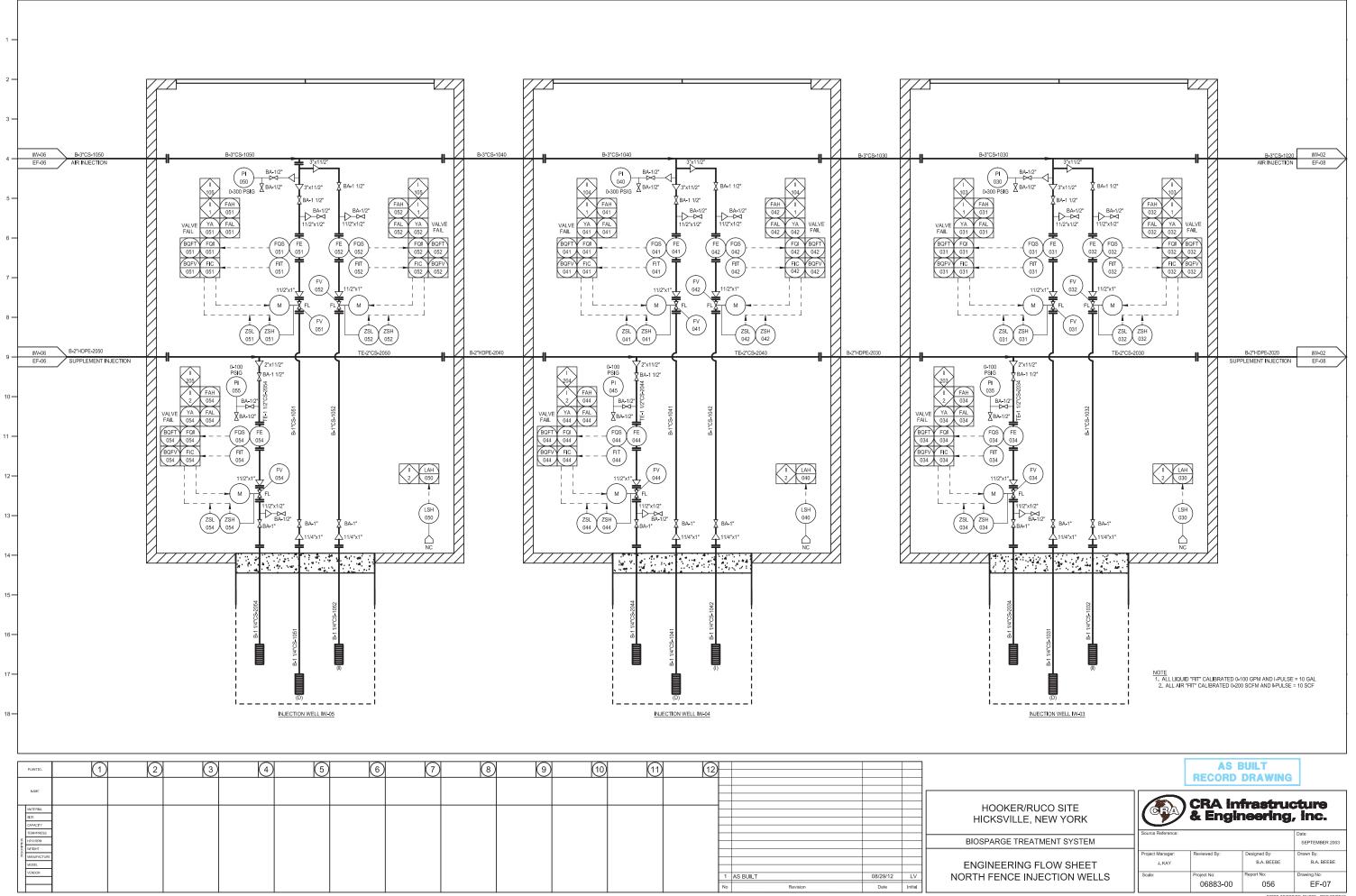


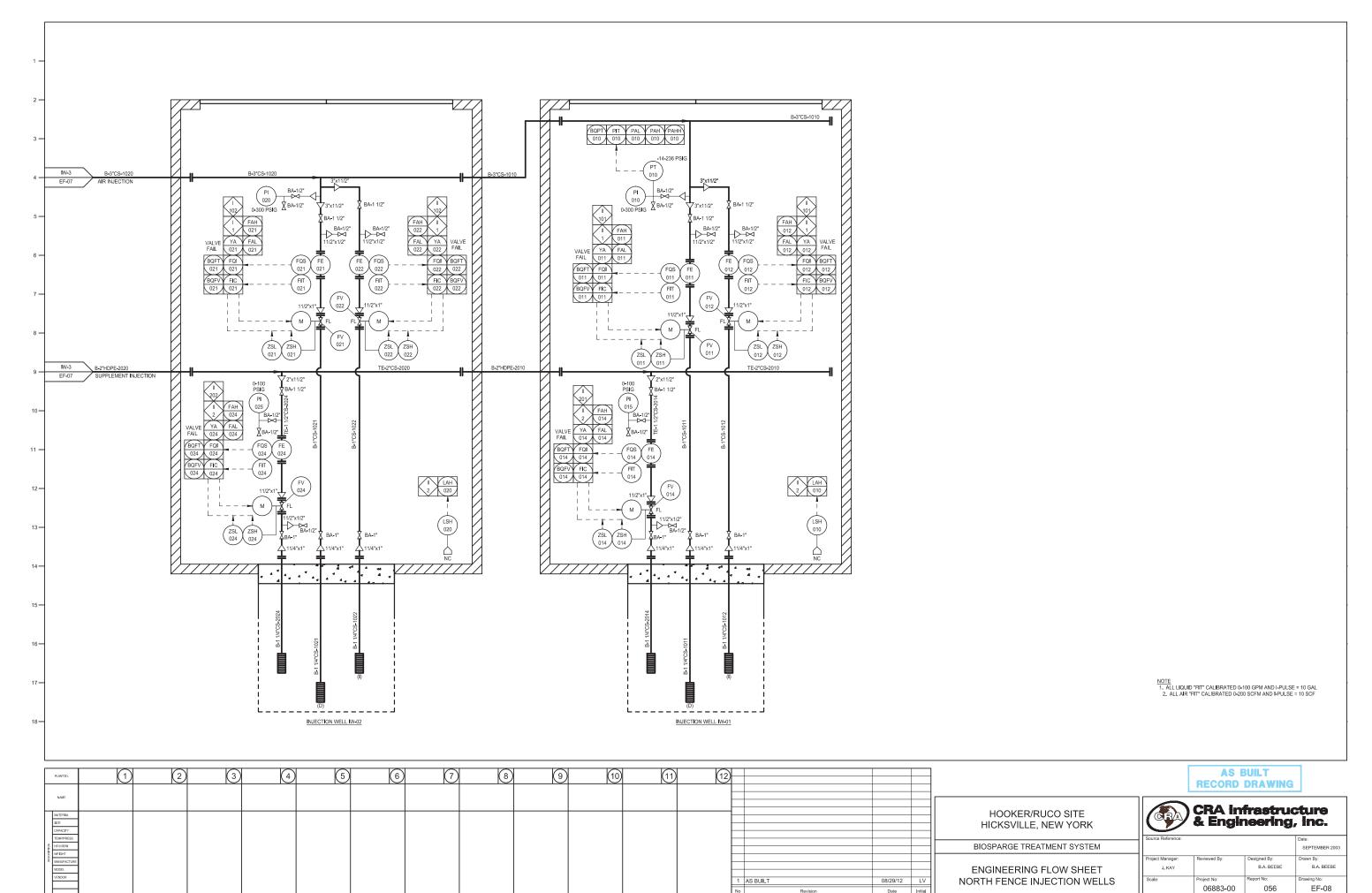
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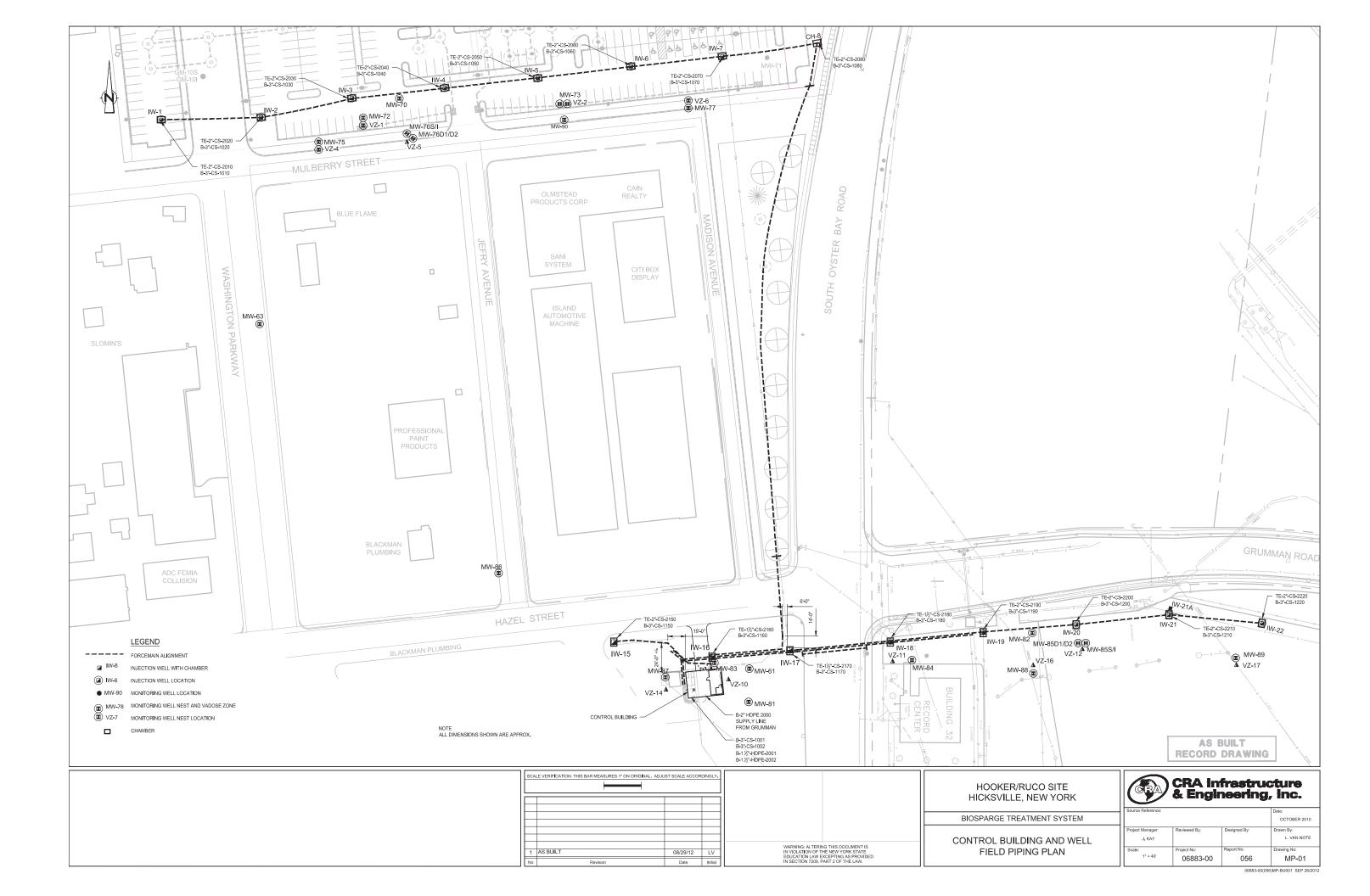
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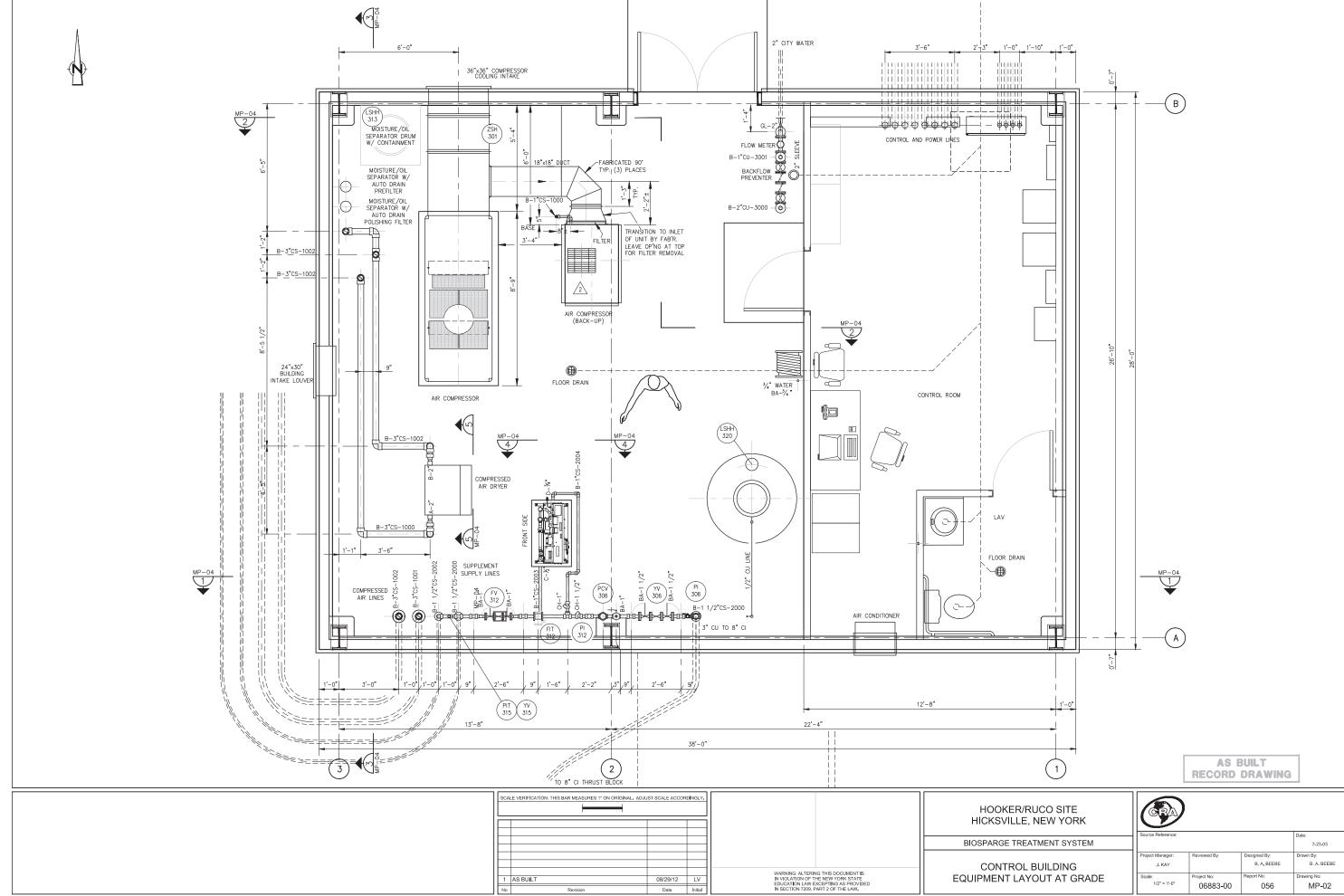


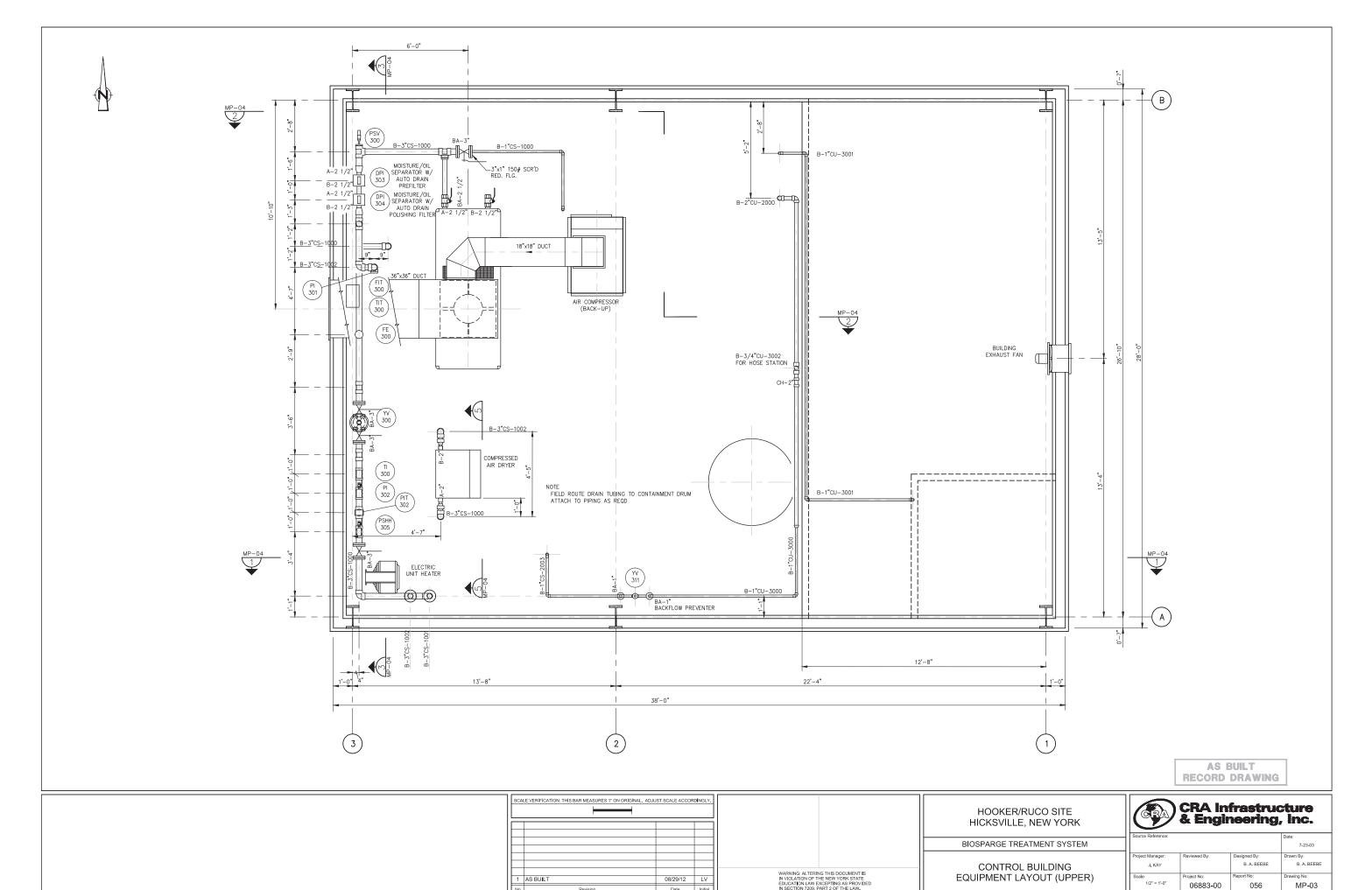


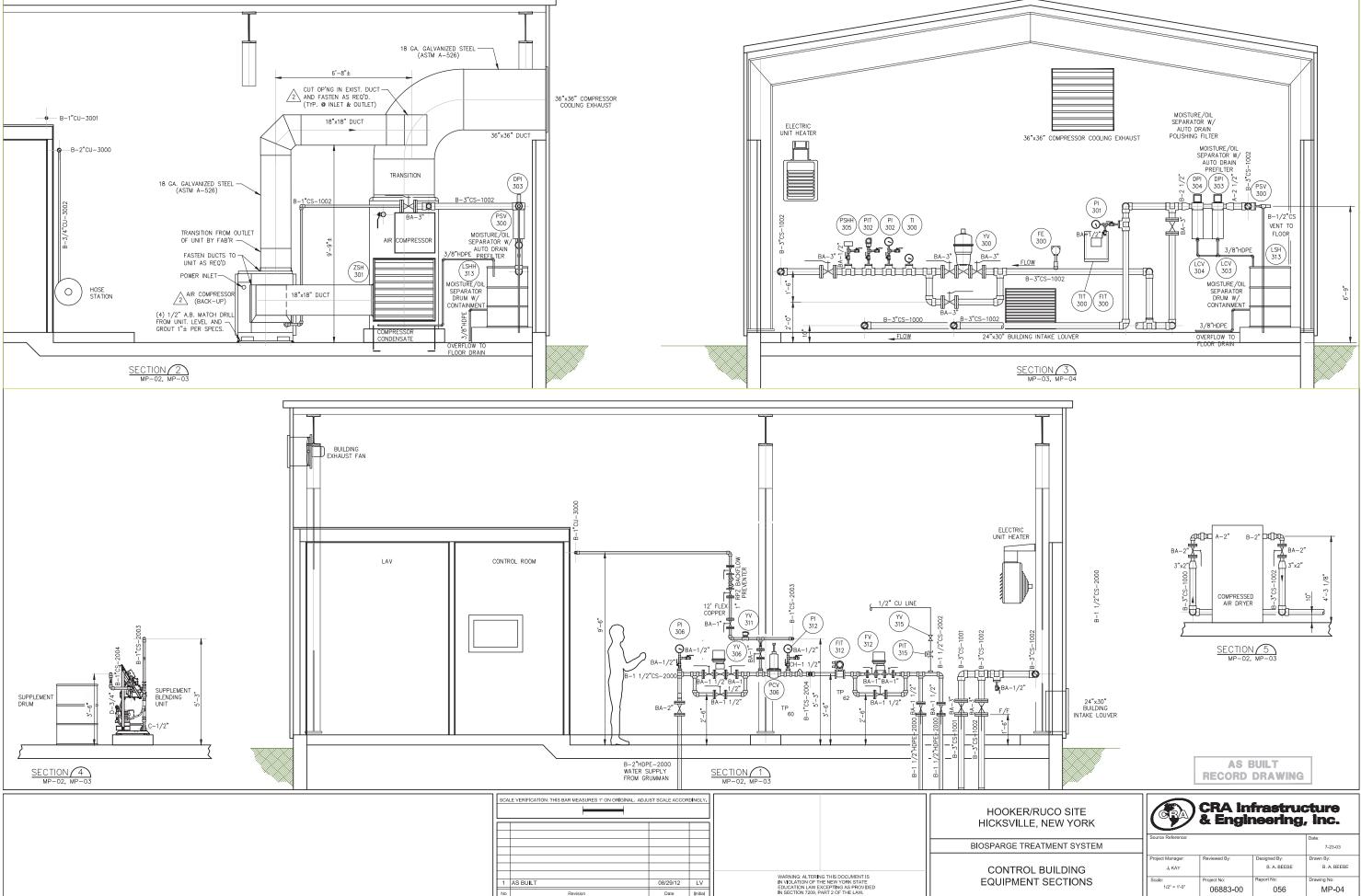


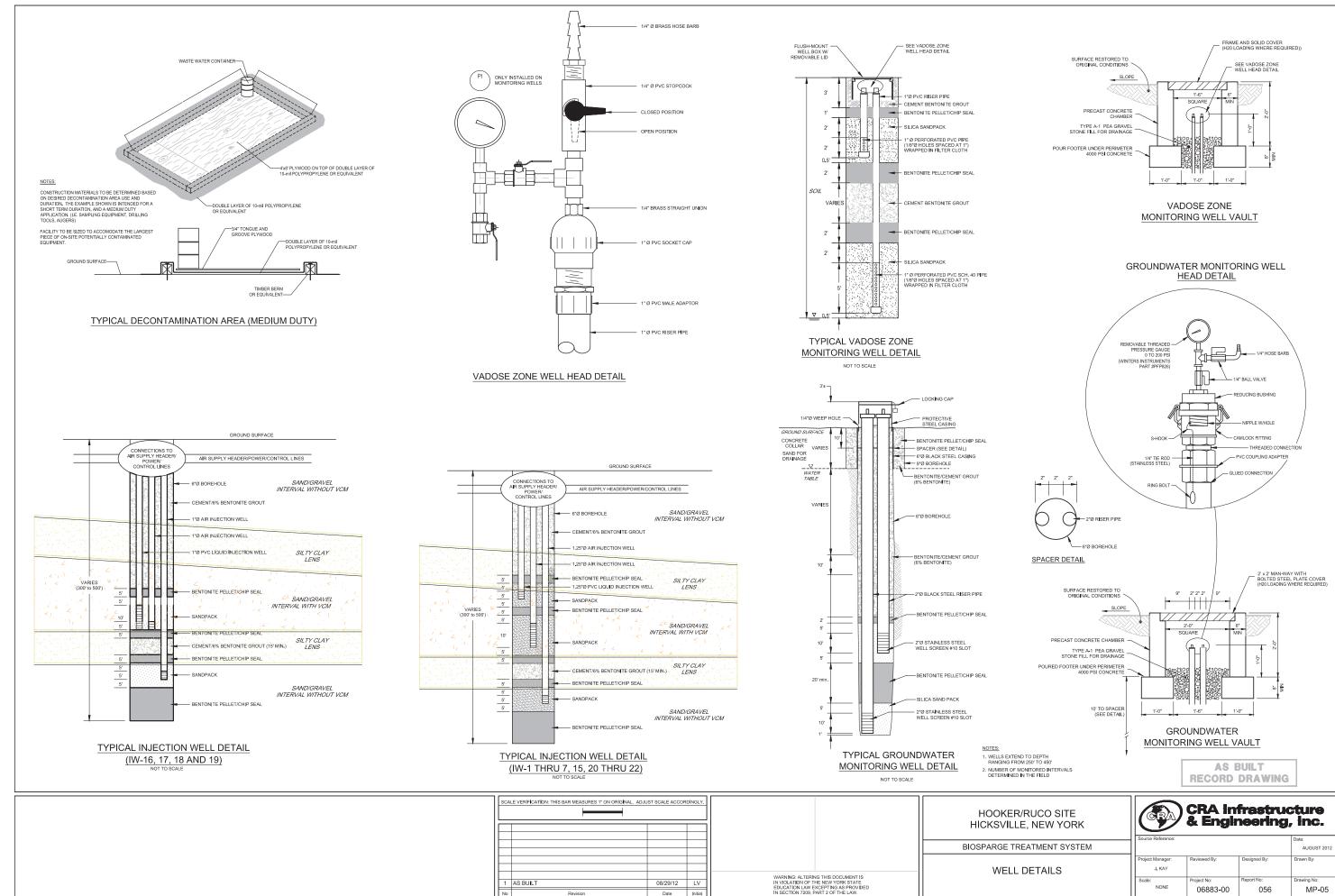
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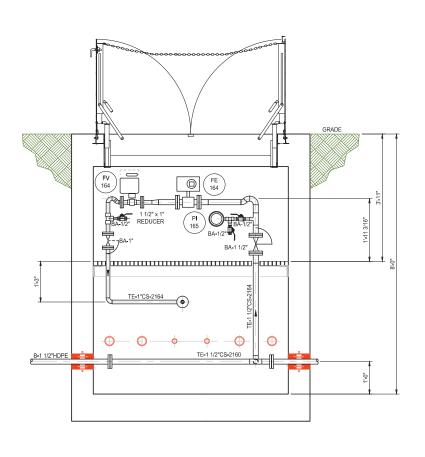




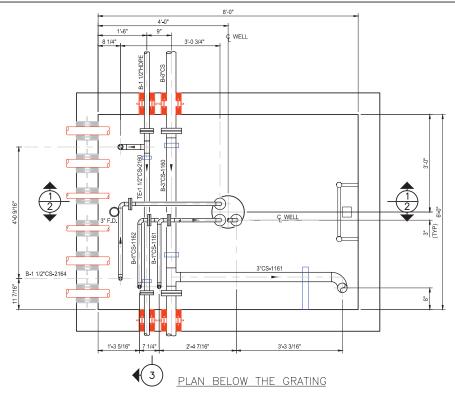


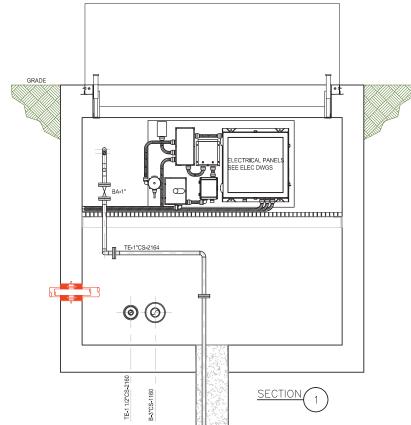


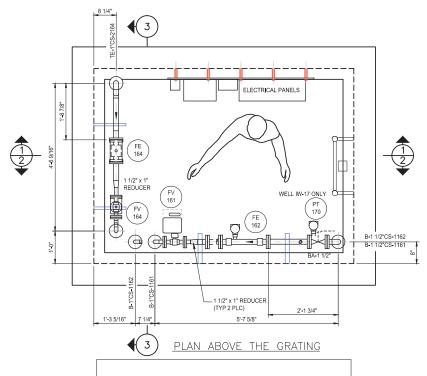
		INS	STRUME	NT NUN	IBER		
WELL NUMBER	LINE NUMBER	PI	PT	FE	FV	FE	"TIE POINT" NUMBER
	TE-1 1/2"CS-2160						TP-4, TP-56
	B-3"-CS-1160	160					TP-6, TP-8
	TE-1 1/2"CS-2164	165		164	164		TP-5
IW-16	B-1 1/2"CS-1161				161	161	TP-7
	B-1 1/2"CS-1162				162	162	TP-9
	TE-1 1/2"CS-2170						TP-10, TP-57
	B-3"-CS-1170	170					TP-12, TP-14
	TE-1 1/2"CS-2174	175		174	174		TP-11
IW-17	B-1 1/2"CS-1171		170		171	171	TP-13
	B-1 1/2"CS-1172				172	172	TP-15
	TE-1 1/2"CS-2180						TP-16,TP-58
	B-3"-CS-1180	180					TP-18,TP-20
	TE-1 1/2"CS-2184	185		184	184		TP-17
IW-18	B-1 1/2"CS-1181				181	181	TP-19
	B-1 1/2"CS-1182				182	182	TP-21
	TE-1 1/2"CS-2190						TP-22
IW-19	B-3"-CS-1190	190					TP-24
	TE-1 1/2"CS-2194	195		194	194		TP-23
	B-1 1/2"CS-1191				191	191	TP-25
	B-1 1/2"CS-1192				192	192	TP-27

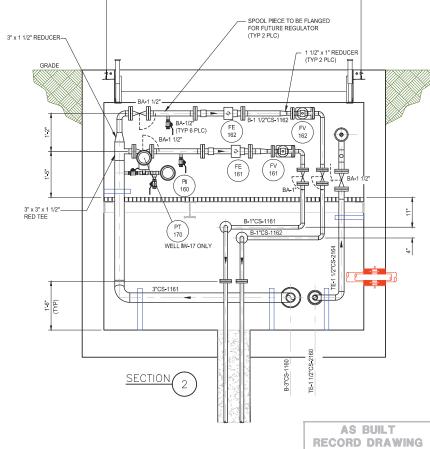






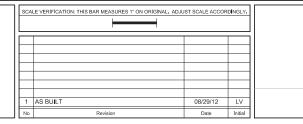






NOTES

- TO THE VAULT SHOWN ABOVE IS FOR WELL IM-16, ALL VAULTS WERE PIPED AS PER THIS TYPICAL DRAWING. INSTRUMENT AND LINE NUMBERS FOR THE OTHER VAULTS MAY BE FOUND ON TABLE.
- 2. WELLS IW-01 THRU IW-07 ARE LOCATED NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE NORTH SIDE OF THE VAULT.
- 3. WELLS IW-15 THRU IW-22 ARE LOCATED JUST NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE SOUTH SIDE OF THE VAULT.
- 4. ALL AIR, LIQUID, CONTROL, AND ELECTRICAL LINES PASS THRU THE VAULTS, EXCEPT IW-1, IW-8, IW-15, AND IW-22. CONTRACTOR PLUGGED ANY ADDITIONAL HOLES IN THESE VAULTS.
- 5. WATER FLOW METER FE-XX4 CONFIGURED FOR REVERSE FLOW AND INSTALLED BACKWARD.



INJ

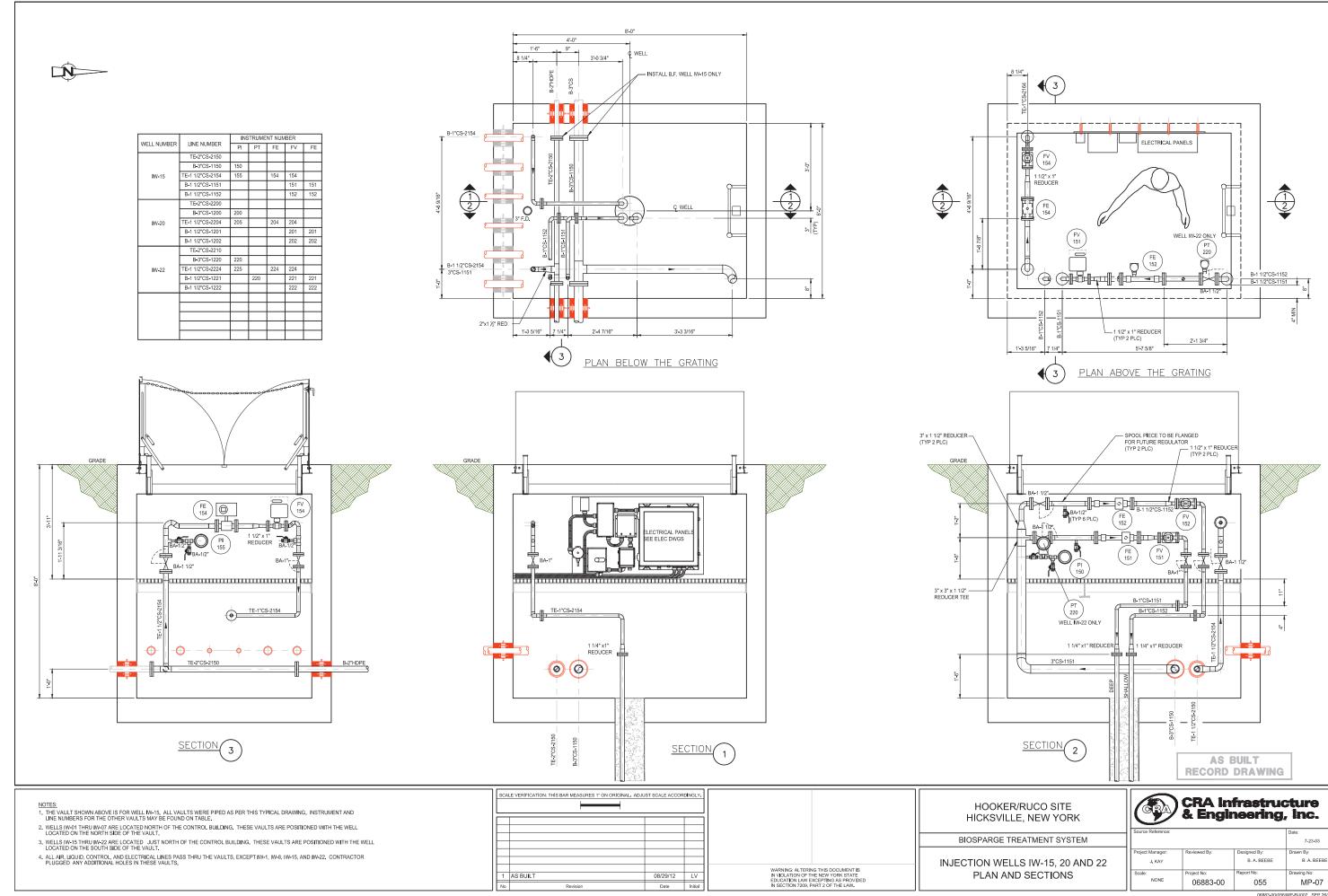
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

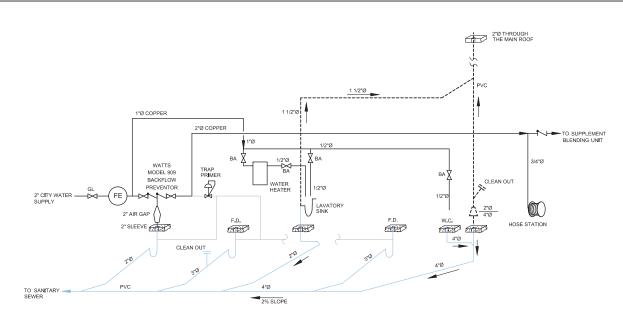
BIOSPARGE TREATMENT SYSTEM

INJECTION WELLS IW-16, 17, 18 & 19 PLAN AND SECTIONS



 Source Reference:			Date:	1
			7-23-03	
Project Manager: J. KAY	Reviewed By:	Designed By: B. A. BEEBE	Drawn By: B. A. BEEBE	
Scale: NONE	Project No: 06883-00	Report No: 056	Drawing No: MP-06	





GENERAL PLUMBING NOTES:

- 1. ALL WORKS MUST COMPLY WITH NEW YORK PLUMBING CODE.
 2. REFER TO WRITTEN SPECIFICATIONS FOR SPECS ON FIXTURES, PIPING MATERIALS, INSTALLATIONS, ETC., UNLESS INDICATED OTHERWISE.
 3. THESE PLANS MAKE NO ATTEMPT TO SHOW ALL ITEMS REQUIRED FOR COMPLETE INSTALLATION, ALL FIXTURES MUST BE ROUGHED IN AND INSTALLED IN STRICT ACCORDANCE WITH MFGS SHOP DWGS AND INSTALLATION PROCEDURES, CONTRACTOR MUST FURNISH AND INSTALL ALL ITEMS, HTTIMGS, AND MISCELLANEOUS HARDWARE NEEDED FOR PLUMBING-CODE COMPLIANCE AND COMPLETE OPERATIONAL SERVICE AND MANTENANCE.

LAVATORY PLUMBING NOT TO SCALE

> **AS BUILT** RECORD DRAWING

1 AS BUILT 08/29/12 LV

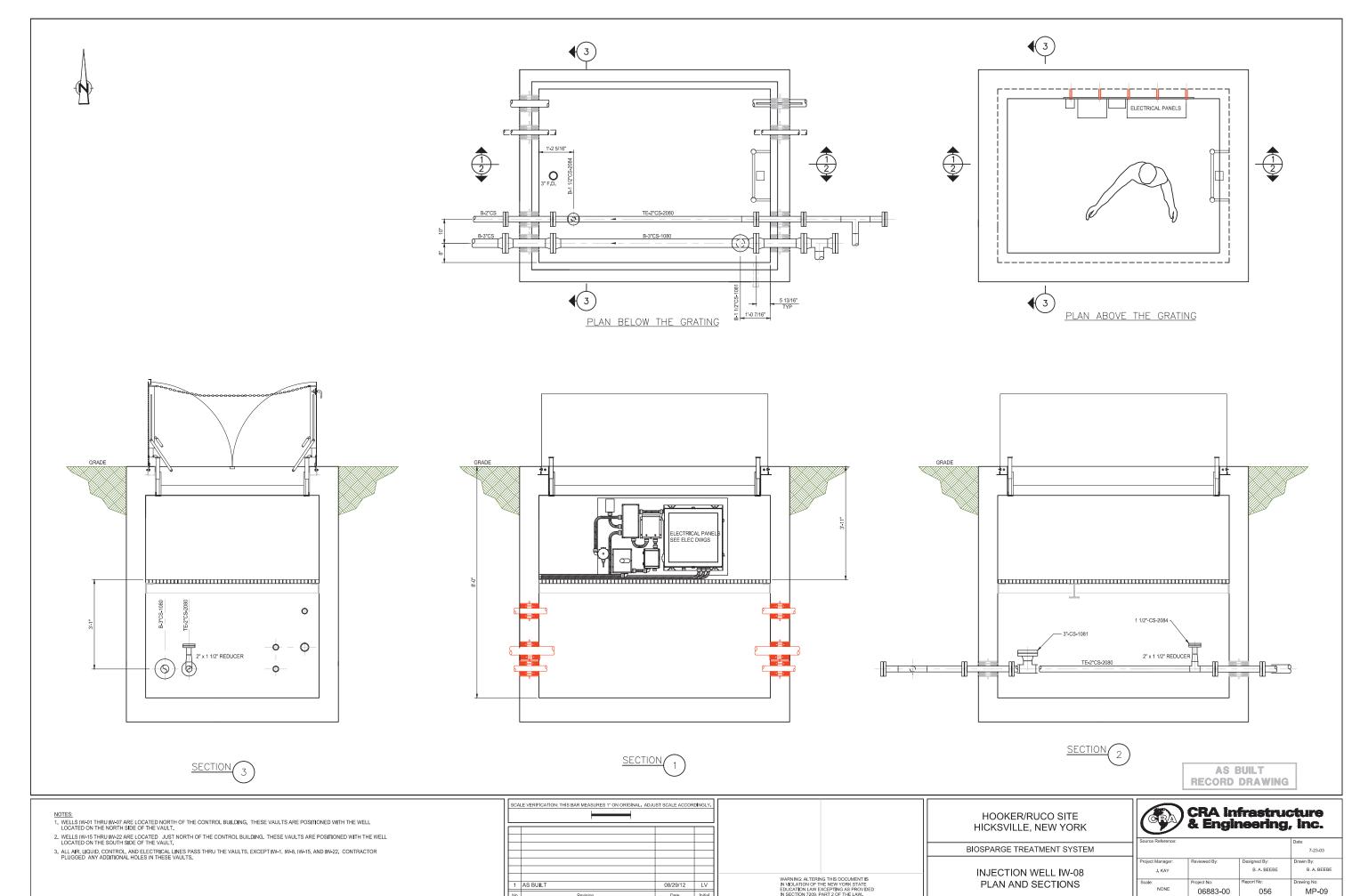
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

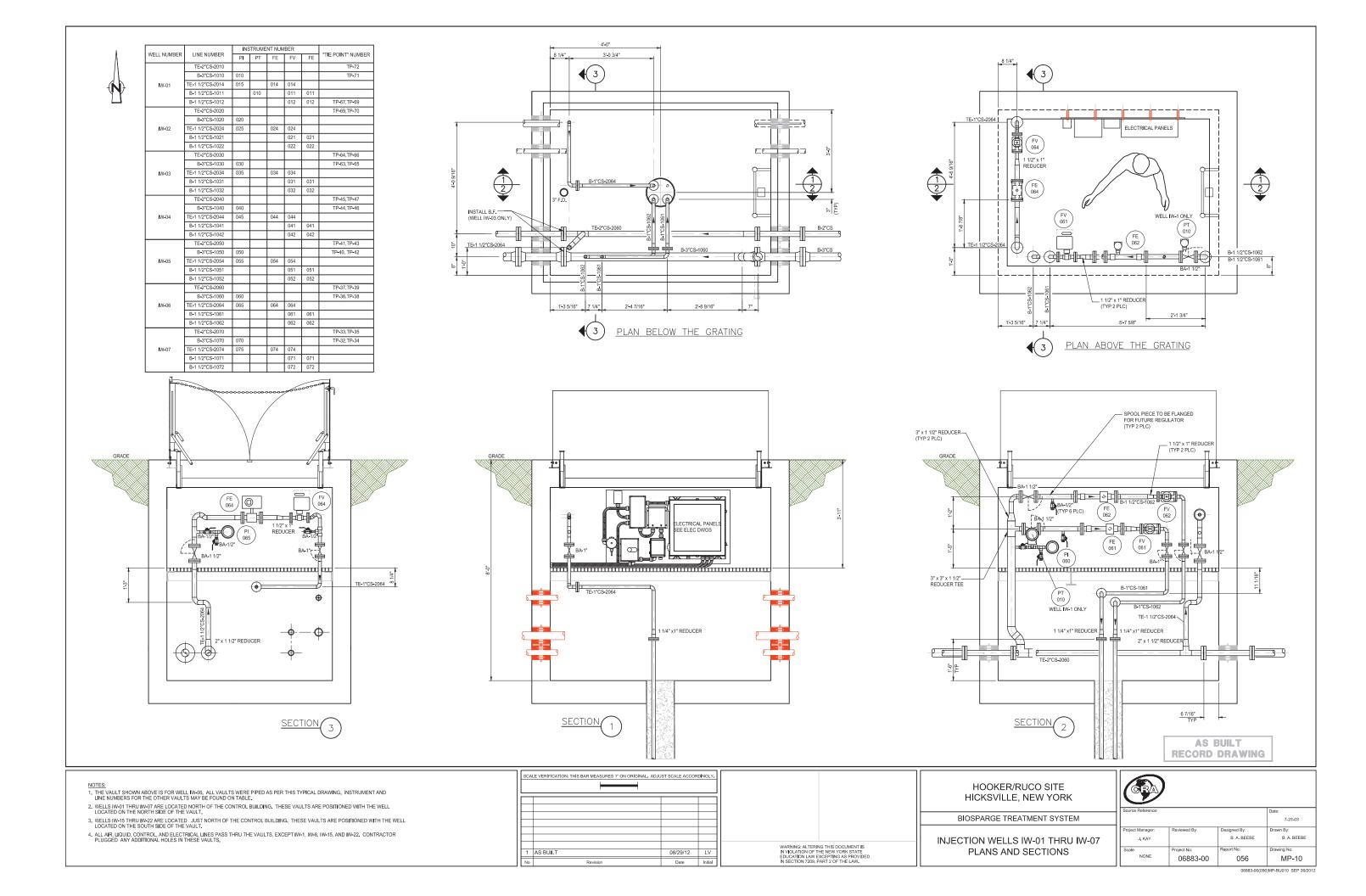
BIOSPARGE TREATMENT SYSTEM

LAVATORY PLUMBING

CRA	CRA infrastruc & Engineering,	ture inc.
Source Reference:		Date:

\dashv	Source Reference:			Date:
				AUGUST 2012
	Project Manager: J. KAY	Reviewed By:	Designed By:	Drawn By:
	Scale: NONE	Project No: 06883-00	Report No: 056	Drawing No: MP-08





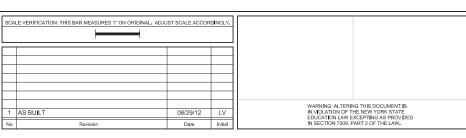
DEM	OFF OF INC.	DECODEDION (TO 8 EDOM)	DIDING DD WING	P & ID DRAWING	DATE COMPLETED	T	RACED		INSULATI	ON	TIE DOINT N	DEMARKO
KEV	SIZE & LINE NO.	DESCRIPTION (TO & FROM)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT No.	REMARKS
	3"CS-1000	PRIMARY AIR COMPR TO COMPR AIR DRYER	MP-02, 03 & 04	EF-01 S1		N	N	N	N	N		INSIDE BLDG
	3"CS-1001	3"CS-1002 TO 3"CS-1080	MP-01	EF-01 S1		N	N	N	N	N		NORTH, UNDERGROUND
	3"CS-1002	COMPR AIR DRYER TO 3"CS-1160	MP-02, 03 & 04	EF-01 S1		N	N	N	N	N		INSIDE BLDG
	3"CS-1010	3"CS-1020 (IW-02) TO END	MP-01, 10	EF-08		N	N	N	N	N		IW-01
	3"CS-1011	3"CS-1010 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-01
	3"CS-1012	3"CS-1011 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-01
	3"CS-1020	3"CS-1030 (IW-03) TO 3"CS-1010 (IW-01)	MP-01, 10	EF-08		N	N	N	N	N		IW-02
	3"CS-1021	3"CS-1020 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-02
	3"CS-1022	3"CS-1021 TO WELL	MP-10	EF-08		N	N	N	N	N		IW-02
	3"CS-1030	3"CS-1040 (IW-04) TO 3"CS-1020 (IW-02)	MP-01, 10	EF-07		N	N	N	N	N		IW-03
	3"CS-1031	3"CS-1030 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-03
	3"CS-1032	3"CS-1031 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-03
	3"CS-1040	3"CS-1050 (IW-05) TO 3"CS-1030 (IW-03)	MP-01, 10	EF-07		N	N	N	N	N		IW-04
	3"CS-1041	3"CS-1040 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-04
	3"CS-1042	3"CS-1041 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-04
	3"-CS-1050	3"CS-1060 (IW-06) TO 3"CS-1040 (IW-04)	MP-01, 10	EF-07		N	N	N	N	N		IW-05
	3"CS-1051	3"CS-1050 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-05
	3"CS-1052	3"CS-1051 TO WELL	MP-10	EF-07		N	N	N	N	N		IW-05
	3"-CS-1060	3"CS-1070 (IW-07) TO 3"CS-1050 (IW-05)	MP-01, 10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1061	3"CS-1060 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1062	3"CS-1061 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-06
	3"-CS-1070	3"CS-1080 (IW-08) TO 3"CS-1060 (IW-06)	MP-01, 10	EF-06		N	N	N	N	N		IW-07
	3"CS-1071	3"CS-1070 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-07
	3"CS-1072	3"CS-1071 TO WELL	MP-10	EF-06		N	N	N	N	N		IW-07
	3"-CS-1080	3"CS-1001 TO 3"CS-1070	MP-01, 09	EF-06		N	N	N	N	N		IW-08

T1/	CIZE 9 I INE No	DESCRIPTION (TO & FROM)	PIPING DRAWING	D & ID DDAWING	DATE COMBLETED	TI	RACED		INSULATI	ON	TIE POINT No.	REMARKS
= v	SIZE & LINE NO.			P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT NO.	KEWAKKS
	3"CS-1150	3"CS-1060 TO 3"CS-1140 (IW-15)	MP-01, 06	EF-01 S1, 05		N	N	N	N	N		IN TRENCH
	3"CS-1151	3"CS-1150 TO WELL	MP-07	EF-05		N	N	N	N	N		IW-15
	3"CS-1152	3"CS-1151 TO WELL	MP-07	EF-05		N	N	N	N	N		IW-15
	3"CS-1160	3"CS-1002 TO 3"CS-1170 (IW-17)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-16
	3"CS-1161	3"CS-1160 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-16
	3"CS-1162	3"CS-1161 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-16
	3"-CS-1170	3"CS-1160 (IW-16) TO 3"CS-1180 (IW-18)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-17
	3"-CS-1171	3"CS-1170 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-17
	3"-CS-1172	3"CS-1171 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-17
	3"-CS-1180	3"CS-1170 (IW-17) TO 3"CS-1190 (IW-19)	MP-01, 06	EF-01 S1, 02		N	N	N	N	N		IW-18
	3"-CS-1181	3"CS-1180 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-18
	3"-CS-1182	3"CS-1181 TO WELL	MP-06	EF-02		N	N	N	N	N		IW-18
	3"-CS-1190	3"CS-1180 (IW-18) TO 3"CS-1200 (IW-20)	MP-01, 06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1191	3"CS-1190 TO WELL	MP-06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1192	3"CS-1191 TO WELL	MP-06	EF-03		N	N	N	N	N		IW-19
	3"-CS-1200	3"CS-1190 (IW-19) TO 3"CS-1210 (IW-21)	MP-01, 07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1201	3"CS-1200 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1202	3"CS-1201 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-20
	3"-CS-1210	3"CS-1200 (IW-20) TO 3"CS-1220 (IW-22)	MP-01, 07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1211	3"CS-1210 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1212	3"CS-1211 TO WELL	MP-07	EF-03		N	N	N	N	N		IW-21
	3"-CS-1220	3"CS-1210 (IW-21) TO END	MP-01, 07	EF-04		N	N	N	N	N		IW-22
	3"-CS-1221	3"CS-1220 TO WELL	MP-07	EF-04		N	N	N	N	N		IW-22
	3"-CS-1222	3"CS-1221 TO WELL	MP-07	EF-04		N	N	N	N	N		IW-22

251	SIZE & LINE No.	DECODIDATION (TO 8 EDOM)	DIDING DDAWING	D 0 ID DD MAINO	DATE COMPLETED	T	RACED		INSULATI	ON	TIE DOINT N	DEMARKO
≺EV	SIZE & LINE INU.	DESCRIPTION (TO & FROM)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT No.	REMARKS
	1 1/2"CS-2000	WATER SUPPLY TO 2"HDPE-2080	MP-02, 04	EF-01 S2		N	N	N	N	N		INSIDE BLDG
	1"CS-2004	1 1/2"CS-2000 TO SUPPLEMENT BLENDING UNIT	MP-02, 04	EF-01 S2		N	N	N	N	N		INSIDE BLDG
	2"CS-2010	2"HDPE-2030 (IW-03) TO END	MP-01, 10	EF-08			Y					IW-01
	1 1/2"CS-2014	2"HDPE-2010 TO WELL	MP-10	EF-08			Y					IW-01
	2"CS-2020	2"HDPE-2030 (IW-03) TO 2"HDPE-2010 (IW-01)	MP-01, 10	EF-08			Y					IW-02
	1 1/2"CS-2024	2"HDPE-2020 TO WELL	MP-10	EF-08			Y					IW-02
	2"CS-2030	2"HDPE-2040 (IW-04) TO 2"HDPE-2020 (IW-02)	MP-01, 10	EF-07			Y					IW-03
	1 1/2"CS-2034	2"HDPE-2030 TO WELL	MP-10	EF-07			Y					IW-03
	2"CS-2040	2"HDPE-2050 (IW-05) TO 2"HDPE-2030 (IW-03)	MP-01, 10	EF-07			Y					IW-04
	1 1/2"CS-2044	2"HDPE-2040 TO WELL	MP-10	EF-07			Y					IW-04
	2"CS-2050	2"HDPE-2060 (IW-06) TO 2"HDPE-2040 (IW-04)	MP-01, 10	EF-07			Y					IW-05
	1 1/2"CS-2054	2"HDPE-2050 TO WELL	MP-10	EF-07			Y					IW-05
	2"CS-2060	2"HDPE-2070 (IW-07) TO	MP-01, 10	EF-06			Y					IW-06
		2"HDPE-2050 (IW-05)										
	1 1/2"CS-2064	2"HDPE-2060 TO WELL	MP-10	EF-06			Y					IW-06
	2"CS-2070	2"HDPE-2080 (IW-08) TO	MP-01, 10	EF-06			Y					IW-07
		2"HDPE-2060 (IW-06)										
	1 1/2"CS-2074	2"HDPE-2070 TO WELL	MP-10	EF-06			Y					IW-07
	2"HDPE-2080	1 1/2"CS-2000 TO	MP-01, 09	EF-06			Y					IW-08
		2"HDPE-2070 (IW-07)										

DEV CIZE & LINE No.		DESCRIPTION (TO & FROM)	DIDING DRAWING	D & ID DDAWING	DATE COMPLETED	TI	RACED		INSULATI	ION	TIE POINT No.	lo. REMARKS
KEV	SIZE & LINE NO.	DESCRIPTION (TO & FROW)	PIPING DRAWING	P & ID DRAWING	DATE COMPLETED	STEAM	ELECTRICAL	THK	SPEC	JACKET	TIE POINT NO.	KEWAKKS
	2"HDPE-2150	1 1/2"HDPE-2160 TO	MP-01, 07	EF-01 S2, 05			Υ					IN TRENCH
		2"HDPE-2140										
	1"CS-2154	1 1/2"CS-2150 TO WELL	MP-07	EF-05			Υ					IW-15
	1 1/2"HDPE-2160	1 1/2"HDPE-2002 TO	MP-01, 06	EF-01 S1, 02			Y					IW-16
		1 1/2"HDPE-2170 (IW-17)										
	1 1/2"CS-2164	1 1/2"CS-2160 TO WELL	MP-06	EF-02			Υ					IW-16
	1 1/2"HDPE-2170	1 1/2"HDPE-2160 (IW-16) TO	MP-01, 06	EF-02			Υ					IW-17
		1 1/2"HDPE2180 (IW-18)										
	1 1/2"CS-2174	1 1/2"CS-2170 TO WELL	MP-06	EF-02			Υ					IW-17
	1 1/2"HDPE-2180	1 1/2"HDPE-2170 (IW-17) TO	MP-01, 06	EF-02			Υ					IW-18
		1 1/2"HDPE2190 (IW-19)										
	1 1/2"CS-2184	1 1/2"CS-2180 TO WELL	MP-06	EF-02			Υ					IW-18
	1 1/2"HDPE-2190	1 1/2"HDPE-2180 (IW-18) TO	MP-01, 06	EF-03			Υ					IW-19
		1 1/2"HDPE2200 (IW-20)										
	1 1/2"CS-2194	2"CS-2190 TO WELL	MP-06	EF-03			Υ					IW-19
	1 1/2"HDPE-2200	2"HDPE-2190 (IW-19) TO	MP-01, 07	EF-03			Υ					IW-20
		2"HDPE2210 (IW-21)										
	1 1/2"CS-2204	2"CS-2200 TO WELL	MP-07	EF-03			Υ					IW-20
	2"HDPE-2210	2"HDPE-2200 (IW-20) TO	MP-01, 07	EF-03			Υ					IW-21
		2"HDPE2220 (IW-22)										
	1 1/2"CS-2214	2"CS-2210 TO WELL	MP-07	EF-03			Υ					IW-21
	2"HDPE-2220	1 1/2"HDPE-2210 (IW-21) TO	MP-01, 07	EF-04			Υ					IW-22
		END										
	1 1/2"CS-2224	2"CS-2220 TO WELL	MP-07	EF-04			Υ					IW-22

AS BUILT RECORD DRAWING



	HOOKER/RUCO SITE HICKSVILLE, NEW YORK
l	BIOSPARGE TREATMENT SYSTEM
-	LINE LIST



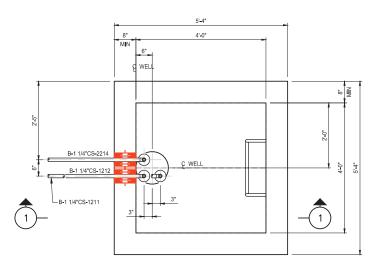
06883-00

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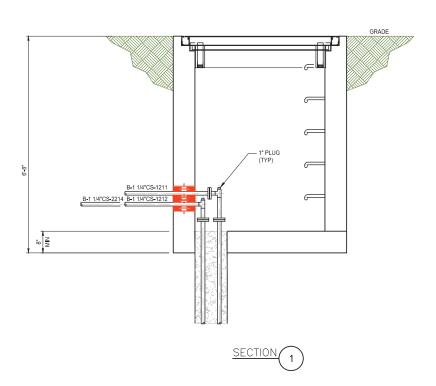
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<u>PLAN VIEW</u>



AS BUILT RECORD DRAWING

- NOTES:

 1. WELLS IW-01 THRU IW-07 ARE LOCATED NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE NORTH SIDE OF THE VAULT.

 2. WELLS IW-15 THRU IW-22 ARE LOCATED. JUST NORTH OF THE CONTROL BUILDING. THESE VAULTS ARE POSITIONED WITH THE WELL LOCATED ON THE SOUTH SIDE OF THE VAULT.

	AND ELECTR I CAL HOLES IN THESE	U THE VAULTS	, EXCEPT IW-1,	IW-8, IW-15, AND IW-2	2. CONTRACTOR

SCAI	LE VERIFICATION: THIS BAR MEASURES 1° ON ORIGINAL. ADJU	JST SCALE ACCOR	DINGLY.
_			
1	AS BUILT	08/29/12	LV
No	Revision	Date	Initial

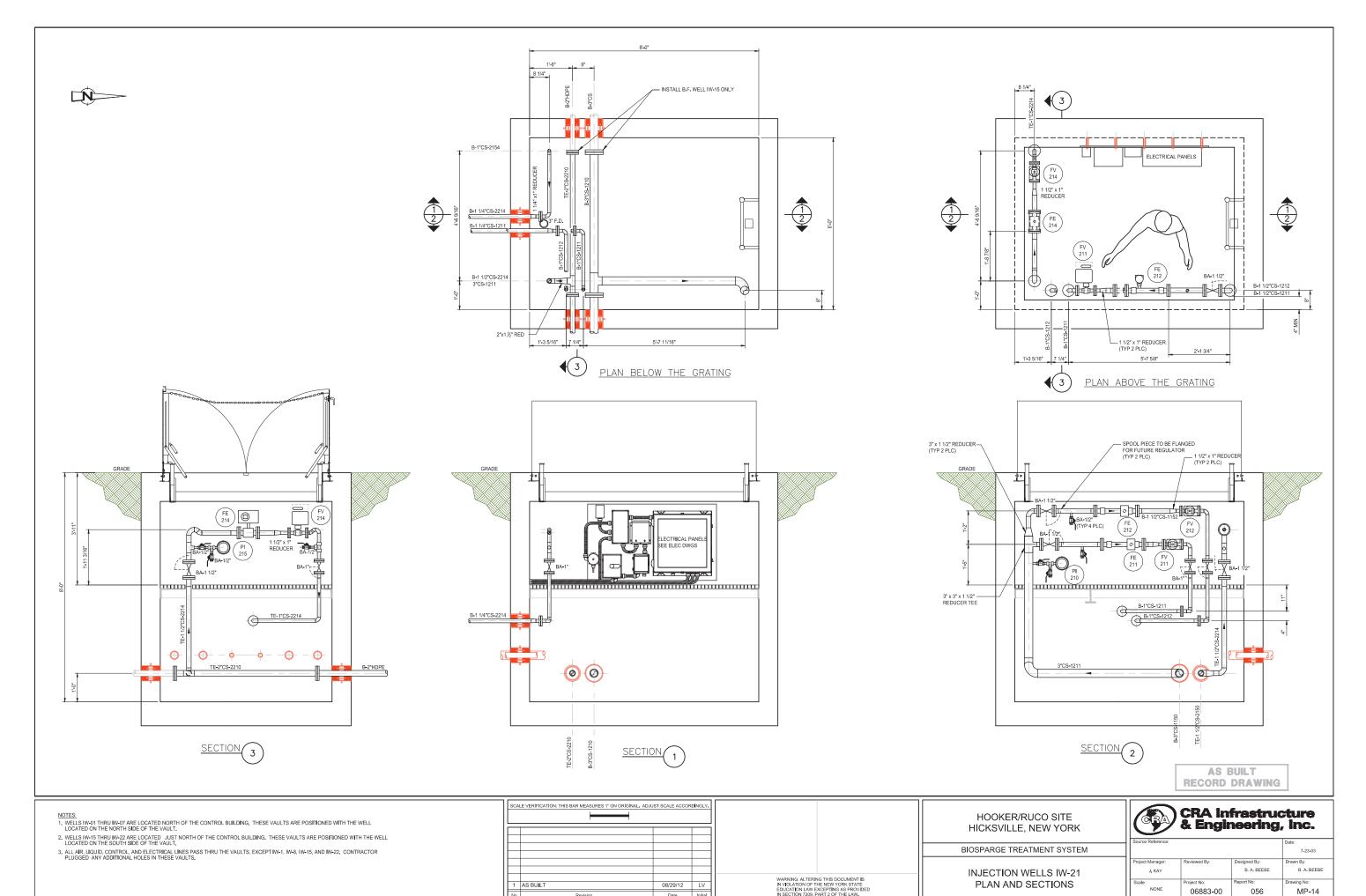
HOOKER/RUCO SITE HICKSVILLE, NEW YORK

BIOSPARGE TREATMENT SYSTEM

INJECTION WELLS IW-21A PLAN AND SECTIONS

CRA infrastructure & Engineering, Inc.

_			
Source Reference:			Date:
			7-23-03
Project Manager:	Reviewed By:	Designed By:	Drawn By:
J. KAY		B. A. BEEBE	B. A. BEEBE
Scale:	Project No:	Report No:	Drawing No:
NONE	06883-00	056	MP-13



B83-00(056)MP-BU007 SEP 26/201

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STRATIGRAPHY, GEOPHYSICAL, AND WELL INSTRUMENTATION LOGS

	PRO	NEXT NUT NOT	THE Hocker Russ DEBLING CONTRACTOR BOACH L THE GEST DEBLING CONTRACTOR BOACH L SHIP GEST SUPPLIES SLEVATION WEATHER (A.M.) (P.M.)				DATI DATI DRIL	TONG N C\LIME C\LIME	HARTO HTART COMPL ETHOD WISOR	ETHED	4/20/ **C	/ /µ			
11	ATIGRAI ITERVAI IN H		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTE, RELATIVE DENEITY/COMESSIENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	A M M M			PENET	PLE D RATION ORD ON EI	î	LS	S I A N W T	P /	C H A L Y S	O R A I N
E C S	A T	T	GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P	PE LT IH NO	6"	(228)	CORD	N-VAL VERIE	Pari	R	ANTERVAL	Ď F D	L S L S	5 1 7
0		37		#	Q D	Ť	<u> </u>	<u> </u>	ٿ		-	<u>r</u>	(ppm) 4.3		В
			fan brown medium-coarse sandt gravel Some finesand & Silt, loose	 						-	<u> </u>	-	7.5		-
7		57	tan brown medium sand loose \$1050'												
<u> </u>			THE PROGRAM SANS 10035	 				-		-			0.6		
7_		77	tan brown fine-medium sand, loose										0.3		-
7		90	tan brown fine- modium sand 1 looks							-			0.0		
10		96	Orange brown medium- course send + gravel									<u> </u>	0. •		
-,			some silt, loose		 			ļ							
96		100	light brown fine sand + silt , firm										O. o		
90		108	dark gray/block 5.1ty clay stiff										0.0		_
୦ ହ		117	light gray/tan brown fine sand still, some		-								0.3		_
		-	medium sand												
CI	NOTES AND MODENT	rs	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTE, N-VALUE, SAMPLE RECOVERY HOTES					HESS _							

HIC SAMPLE DESCRIPTION				CHA	Supri	VIBOR	_ <u>5.</u>					
ORDER OF DESCRIPTORS: SOIL TIPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENEITY/CONSIDERCY, CRAIN SIZE/PLASTIONY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	SAN	8 A M M P B		l LIGB	REC	RATION ORD ON BI	nwe	S	S I A N M T	P/	C A H M L L Y	O R A 1
O SAMPLE IS TOO DRY TO ROLL (INDICATE IF MUSICURE WAS ADDED OR NOT).	PLE	IIH	6"	8.	RECC	VERIES	3)	- R	E Y	D F	LS	8 1 2
127 light gray medium sand loose									<u>L</u>	(ppm)		Ē
47 tan brown + light gray fine- medium sand										1.7		
Slight oder loose										7-7		_
67 light gray + tan brown fine-medium sand, toose			-							4.0		
177 fan brown medium send. loose				_								
				-						1.2		
97 light gray medium sand, loose								_		0.6		
17 tan brown fine-medium sand, some silty pockets loose				\dashv		_						
38 Jan Argun Million Card Care Co.										7-1		
				\dashv				_		2.8		
.56 Carle gray / black silty clay, stiff						-+		\dashv				
277 tan brown medium sand longe												
			OPSOIL	THICKN	SS _					2.7		
	The sample is too DRY to ROLL (INDICATE IF MOISTURE WAS ADDED OR ROT). Comparing the sample of th	SAMPLE IS TOO DRY TO ROLL (INDICATE IF MISSTURE WAS ADDED ON NOT). ight gray medium sand loose 1 tan brown t light gray fine-Medium sand	BAMPLE BY TOOL DIRY TO ROLL (INDICATE BY MOLETURE WAS ADDED OR NOT). 1 ight gray medium sand loose 47 tan brown t light gray fine-medium sand some sand sold of Dight gray tan brown fine-medium sand sold of Dight gray tan brown fine-medium sand sold of Dight gray medium sand, loose 47 tan brown medium sand, loose 47 tan brown fine-medium sand, loose 47 tan brown fine-medium sand, loose 48 tan brown fine-medium sand, loose 49 tan brown fine-medium sand, loose 49 tan brown fine-medium sand, loose 49 tan brown fine-medium sand, some sity pockets loose 49 tan brown fine-medium sand, some fine sand this, loose 49 tan brown medium sand, some fine sand this, loose 49 tan brown medium sand, some fine sand this, loose 49 tan brown medium sand, some fine sand this, loose 49 tan brown medium sand, loose 40 tan brown medium sand, loose 40 tan brown medium sand, loose 41 tan brown medium sand, loose 42 tan brown medium sand, loose 43 tan brown medium sand, loose 44 tan brown medium sand, loose 45 tan brown medium sand, loose 46 tan brown medium sand, loose 47 tan brown medium sand, loose 48 tan brown medium sand, loose 49 tan brown medium sand, loose 49 tan brown medium sand, loose 49 tan brown medium sand, loose 40 tan brown medium sand, loose 41 tan brown medium sand, loose 41 tan brown medium sand, loose 42 tan brown medium sand, loose 43 tan brown medium sand, loose 44 tan brown medium sand, loose 45 tan brown medium sand, loose 46 tan brown medium sand, loose 47 tan brown medium sand, loose 48 tan brown medium sand, loose 49 tan	BANFIE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). 1 ight gray medium sand loose 17 tam brown t light gray fine-Medium sand sond 5 light oder loose 67 light gray i fan brown fine-Medium sand soci 080- 17 tam brown medium sand, loose 17 tam brown fine-Medium sand, loose 17 tam brown fine-medium sand, loose 18 tam brown fine-medium sand, loose 19 light gray medium sand, loose 19 light gray medium sand, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till, loose 19 tam brown medium sand, some fine sand till till, loose 19 tam brown medium sand, some fine sand till till till till till till till til	Sample is too DRY to ROLL (INDICATE IF MOSSIURE WAS ADDED ON NOT). 127 light gray medium sand loose 47 tan brown tight gray fine medium sand sone 67 light gray tan brown fine-medium sand sone 67 light gray tan brown fine-medium sand sone 77 tan brown medium sand, loose 49 light gray medium sand, loose 19 tan brown fine-medium sand, loose 19 tan brown fine-medium sand, loose 19 tan brown fine-medium sand, some silty pockets, loose 19 tan brown medium sand, some fine sand tilt, loose 19 tan brown medium sand, some fine sand tilt, loose 19 tan brown medium sand, some fine sand tilt, loose 19 tan brown medium sand, some fine sand tilt, loose 19 tan brown medium sand, some fine sand tilt, loose 19 tan brown medium sand, loose 19 tan brown	SAMPLE IS TOO INT TO ROLL (INDICATE IT MODITION OF MOISTURE IF THE BOOK OF BOTTOM OF B	DAMPILE IS TOO DRY TO ROLL (RODICATE IT MOSTURE WAS ADDED ON NOT). 127 light gray medium sand loose 47 tam brown t light gray fine-Medium sand, soce 67 light gray t fan brown fine-medium sand, soce 67 light gray t fan brown fine-medium sand, soce 97 light gray medium sand, loose 17 tam brown fine-medium sand, loose 17 tam brown fine-medium sand, loose 18 tam brown fine-medium sand, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till, loose 19 tam brown fine-medium sand, some fine sand till politety, loose 19 tam brown fine-medium sand, some fine sand till politety, loose 19 tam brown fine-medium sand, some fine sand till politety, loose 19 tam brown fine-medium sand, some fine-medium sand,	10 SAUFTE IS TOO BRY TO ROLL (INDICATE IS DOTTON OF MOISTURE IS THE BOOK OF	10 SAUFFLE BY TOO BRY TO ROLL (MIDICATE IN MOSTURE WAS ADDED OR NOT). 127 light gray medium sand loose 47 tan brown tight gray fine medium sand sand sold of	Solve Develope Bry to Roll (Mollower Fire Moderly Rep File) 127 light gray medium fand loose 47 light gray medium fand loose 47 light gray t fan brown fine-medium sand, bose 67 light gray t fan brown fine-medium sand, bose 68 light gray t fan brown fine-medium sand, bose 97 light gray medium sand, loose 49 light gray medium sand, loose 41 tan brown fine-medium sand, loose 41 tan brown fine-medium sand, loose 42 light gray medium sand, loose 43 light gray medium sand, loose 44 light gray medium sand, loose 45 light gray medium sand, loose 46 light gray medium sand, loose 47 light gray medium sand, loose 48 light gray medium sand, loose 49 light gray medium sand, loose 40 light gray medium sand, loose 41 light gray medium sand, loose 41 light gray medium sand, loose 42 light gray medium sand, loose 43 light gray medium sand, loose 44 light gray medium sand, loose 45 light gray medium sand, loose 46 light gray medium sand, loose 47 light gray medium sand, loose 48 light gray medium sand, loose 49 light gray medium sand, loose 40 light gray medium sand, loose 40 light gray medium sand, loose 40 light gray medium sand, loose 41 light gray medium sand, loose 41 light gray medium sand, loose 42 light gray medium sand, loose 43 light gray medium sand, loose 44 light gray medium sand, loose 45 light gray medium sand, loose 46 light gray medium sand, loose 47 light gray medium sand, loose 48 light gray medium sand, loose 49 light gray medium sand, loose 40 light gray medium sand, loose 40 light gray medium sand, loose 40 light gray medium sand, loose 41 light gray medium sand, loose 42 light gray medium sand, loose 44 light gray medium sand, loose 45 light gray medium	SAMPLE IS TOO DRY TO ROLL (ADDICATE THE MEMBERS WAS ADDED ON NOT). 127 Ingh! gray medium sand loose 47 Ingh! gray medium sand loose 47 Ingh! gray it is brown fine-medium sand sand sand sold sold sold sold sold sold sold sol	127 I tan brown tight gray fine- medium sand, loose 13 ight gray tan brown fine- medium sand, loose 14 tan brown tight gray fine- medium sand, loose 15 ight gray medium sand, loose 16 ight gray tan brown fine- medium sand, loose 17 tan brown fine- medium sand, loose 18 ight gray medium sand, loose 19 ight gray medium sand, loose 19 ight gray medium sand, loose 10 ight gray medium sand, loose 11 tan brown fine- medium sand, loose 12 tan brown fine- medium sand, sand postations 13 tan brown fine- medium sand, sand sand tilt, loose 15 dan brown medium sand, sand sand tilt, loose 16 dank gray black silty clay, stiff 17 tan brown medium sand, loose 18 per of per

			(P.E.)				CRA	SUPE		<u></u>	Daly						
T1	ATIGRAI TERVA 3 IN 11	AS .	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:	1	8	1			PLE 1		is		7	C A	G R		
F	A	T O	SOL TYPE SYMBOL(S) PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRADATION/STRUCTURE, COLOUR, MOSTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	S M P L	A W P B L H N O		epi (RB	RECO	RATIO	LOWS		SANTE PROPERTY	P / D F I D	C E I A E Y	A I N B		
277	1	297		ř	å D	6"	6,	8"	6"	N	R	Ť	(ppm)	LB	Z E		
			tan brown medium squad, some fine saml + sill + clayey pockets from	-		 	ļ						3.4		-		
			Today social of 11/100	-		 		_									
197		305	tan broken medium sand some fine sand + silt	+	-	-				 	 		- ~				
			lopse	1						-	 		2.5	 			
		5/10	7					_		-							
305		342	dark gray black silty clay, Stiff										0.0				
341		347	L L L L L L L L L L L L L L L L L L L	 	<u> </u>												
37-		 '' 	fan brown + light gray for sond + Filt, firm	 									0.2				
	347		End of boring	-													
				 					-								
		 															
		 										·					
		 		<u> </u>										-			
				 													
				 													
	notes and mant		DEPTH OF BOREHOLE CAYINO DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH EPLIT-SPDON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LENGTH, AND SAME HOURS:						TOPSOIL THICKHESS								

INJECTION WELL INSTRUMENTATION LOG
PROJECT NAME: Hooke - RULD HOLE DESIGNATION: TW-
PROJECT No: 6853 DATE COMPLETED: 4/28/11
CLIENT: GSHZ DRILLING METHOD: 50016
LOCATION: 11:245 VILLE, IV 1 URA SUPERVISOR: 7 1 JOHN
CONNECTIONS TO AR SUPPLY HEADER/POWER/CONTROL LINES POWER CONTROL LINES CONNECTIONS TO AR SUPPLY HEADER/POWER/CONTROL LINES POWER CONTROL LINES BOREHOLE Ø: BOREHOLE Ø: AIR INJECTION WELL Ø: AIR SUPPLY HEADER/POWER/CONTROL LINES WATER IL AIR INJECTION WELL Ø: AIR INJE
WATER: X Continuous Slot Perforated Louvre Other:
CREEN MATERIAL: AIR: X Stainless Steel Plastic Other:
WATER: Stainless Steel 🔀 Plastic Other:
DLE DIAMETER: 6 h 347' 7" h 287'
EVELOPMENT: METHOD: AN lift DURATION:

PROJECT CLIENT	STRATIGRAPHY LOG (OVE NAME Hole, Rue o DRILING CONTRACTOR Board Long NUMBER (1933 DRILER G5HZ BURFACE ELEVATION WEATHER (A.M.) (P.M.)	year			DATE/ DATE/ DRILLI CRA S	DESIGN TIME 8 TIME C ING ME	TARTE OMPLE THOD . ISOR _	TED 4	/7/1 1:2 Daly	ì		701	
STRATIGRAPHI INTERVALS IPTES IN ft/m	BGB ORDER OF DESCRIPTORS: SUL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR,	S A M P	S A M M P E L T		P SPLIT (REC	ENETRA RECO SPOO ORD N	ATION RD N BLA VALU	ows Jes	S	S I A N M T P E L R	P / D F	C A H N E A L I Y	G R A I N
R	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	6"	6"	6°	6") N	R	E V	D (ppm)	C S I	I Z E
2 3	Some fly sand +5:11										0.1		
8 5	8 fan brown fine - med sand, loose, little recovered 2050'										0.2		
8 7	10 Jan brown + light gray medium sand, loase										0.2		
10 7	8 dan brown + light gray fine sand + 5ilt, firm	-									0.0		
8 9	B fan brown + light gray fine sand +5:14. firm			<u> </u>							0.0		
8 /	2 tan brown + light gray fine sand + silt, firm	ļ									0.0		
02 1	4 tan brown Silty elay, strff										0.0		
4 1	8 tan brown medium sand, loose										0./		
NOTES AND	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSO	IL THICK	NESS					0.0		

e e e

FTTD	ATIGRA		CEESVILL, NY WEATHER (AM).		_		DRL	E/TIME LING M SUPER	DTHOD	<u>. در ک</u>	Daly				
DEPTHS	TERVA	PEUC LS	SAMPLE DESCRIPTION DEDER OF DESCRIPTORS:					SAMI	LE	ETAI	LS			CA	a
F R O M	A T	m BGS	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), ESCONDARY COMPONENTS, RELATIVE DENSITY/COMMENCE, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOSTURE CONTENT, SUPPLIEMENTARY DESCRIPTORS HOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE EMPLIE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	SAWPLE	A M P L I I N O		52L (RE	PENET. REC IT SPO CORD RECO	ORD DN HI N-VAL	LOWS		S I A N M T P E L R	F / D F	HNALYSIS	R A I N S I
138		148	light gen. B	j.	G D	8,	6'	6"	6"	N	R	Å L	(ppm)		Z
			pockets, slight oder										0.6		
110			3.3.0		L		 								
148		60	light gray medium sand, losse, odor			 	-	-		 			2.2		
60						_							2.2	-	
-		168	light gray + tan brown fine - medium sand, firm oder		-	-	_						4.0		
68		170	I have been a local Confidence									···········	,		
		7.1R	tan brown medium sand, some fine rand still, loose										0.5		
78		198	ight gray medium sund loose												
			Jane, Idea										0.2		
98		208	light gray Medium Sand, loose				_								
OB		444											0.5		
	-	228	light gray fine sand + 5.11. firm, trace clay						\neg	-+			0.2		
28		242								$\neg \uparrow$			7,5		
			tan brown fine-med sand, some silt firm										0.5		
2	_	248	dark gray / black Silty Clay, stiff			_					_				
						-							0.0		
.	Tes	יון	EPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER ATER LEVEL IN OPEN BOREHOLE ON COMPLETIONAPTERHOURS OMPLETION DETAILS:			OPSOIL	THIOGR	ESS			!			. <u> </u>	

	PRO CLIE LOQ	iect nui nr <u> </u>	THE HORN RUCO THE LOT DRILLING CONTRACTOR BOWY Longly OF HE THE LOT OF THE SURFACE ELEVATION WEATHER (A.M.) (P.M.)				DATE DATE DRILL	TIME TIME	STARTO STARTO COMPL STHOOL STHOOL	ETED _	7	L			
17		m BGS	GRONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICTY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	9 A X P	A M P E L H		SPLI (REC	ENET REC T SPC	RATION CORD CON HI N-VAL	OWE	s	S I A N P E L R	P / D P I	C AN ALYS	G R A I N
И	T	Ö	SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOLETURE WAS ADDED OR NOT).	L	N O	6"	8"	6"	в"	N	R	E V	(ppm)	LS	Z
248		258	No Return												
.58		273	tan brown medium sand, some fine sand +silt, loose										0.5		
13		280	dark gray silty clay, stiff									*	0.0		
80		298	tan hown fine sand till, some med sand, film										1.2		
98		307	fan brown fine-medium sead, loose, some fine randtsitt										2.4		
07		328	dark Gray/ black silty clay very stiff										0.0		
28		336	dak gray / black 5: Ity clay Very Ft. Ff				•						0.0		
36		348	light gray fine sand + silt, firm										1.2		
	348		end of bacing	····											
-															
	OTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BIOREHOLE ON COMPLETION AFTER HOURS			TOP SQL	. тніска	(E53 _							
COI	and Duents	3	ncte: for each split—spoon sample, record blow counts, N—Value, sample recovery le Notes:	юты, <i>и</i>	HD SAMP	LE INT	ERVAL								

	STRUMENTATION LOG
PROJECT NAME: Hooler Ruco	HOLE DESIGNATION: TW-Z
PROJECT No: 6883	DATE COMPLETED: 4/8/11
CLIENT: GSHI	DRILLING METHOD: Sonic
LOCATION: Hicksville, NY	CRA SUPERVISOR: _ 5. Daly
CONNECTIONS AIR SUPPLY HEAD POWER/CONTROL LINE	AIR SUPPLY HEADER/POWER/CONTROL LINES
	BOREHOLE Ø: 6 in GROUT TYPE: Portlan Comen / Bentonike AIR INJECTION WELL Ø: 1.25 in MATERIAL: 5 tecl WATER INJECTION WELL Ø: 1.25 in
TOP OF SEAL AT: 190 ft	MATERIAL: stock sch 80 pv C SEAL TYPE: Bentonite Chips AIR INJECTION WELL Ø: 1.25 In MATERIAL: Stret SCREEN: Ø: 1.27 In SLOT SIZE: 10 SEAL TYPE: Bentonite Chips
TOP OF SCREEN AT: 235 ft TOP OF SEAL AT: 240 ft BOTTOM OF SEAL AT: — ft	PACK TYPE: SAND, SIZE #0 SCREEN: Ø: 1.25 In SLOT SIZE: 10 SEAL TYPE: Benton; to Chip
TOP OF SEAL AT:ft	GROUT TYPE: None
BOTTOM OF SEAL AT: 255 ft	SEAL TYPE: Bentonik Ch!ps
TOP OF SCREEN AT: 260 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 265 ft 1	SCREEN: Ø: 1.25 in SLOT SIZE: 10
TOP OF SEAL AT: 27° ft	seal type: <u>Bentonile Chips</u>
SCREEN TYPE: AIR: Continuous Slot Perfor	ated Duvre Other.
WATER: X Continuous Slot Perform	_
	PVC Other:
	PVC Other:
HOLE DIAMETER: 6" 6348' 7" 16 217'	
DEVELOPMENT: METHOD: Aicliff	DURATION:

	PROJ	CT NUM	STRATIGRAPHY LOG (OVER BER 683 SHE SUPPLIES SUPPLIES REVATION (P.M.) (P.M.)	y tar	<u></u>)	DATE/ DATE/ DRILLI CRA 8	TIME TIME ING MI	ethod . Visor _	D 3/ TED 5 3 4 M 5 • 0	/29/ 	3	/_ OF \		
IN	TERVAL IN (t/		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT),	S	N N		P	ENET	RATION CORD CON BL		8	S I A N T M	P /	C A H N E A M L	G R A I N
F R			SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	M P L	PE LT IH		(REC	ORD	N-YAL VERIES	ues		A T P E R V	D F	M L C S A I	s I
0 M	Å T	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6"	8"	8*	И	R	Å L	(ppm)		Z E
0		37	tan brown medium coarse sand + gravel										3.4		
_			Some fine Sand esilt, loose						<u> </u>				 		
7		50	tan brown + light gray medium sand, loose	┢					 				0.0		
-1-		,	D 60												
0		51	light brown medium sand , some fine sand + silt, loose										0.0		
11		70	light gray medium sand, loose										0.1	<u> </u>	
				├			-		}		-		0.0	-	
70		73	light gray fine sand + silt, firm	<u> </u>	 			t							
73		77	tan brown Coarse sand, loose			ļ			Ţ		_		0.0		
17		97	light gray fine-medium sand, loose				ļ						0.1		
7	-	117	light gray + light brown fine-medium sand + silt							1			0.2		
			trace clay (sticky), firm, slight odor							-		 	-	ļ	
C	NOTES AND OMMEN		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY L NOTES:				OIL THICK			<u> </u>				<u> </u>	



	PROJ PROJ CLIRI LOCA	ect name ect nume nt G: tion H.	DRILLING CONTRACTOR Boot Long your GET STATE BURNACE BLEVATION WEATHER (A.M.) (P.M.)				DATE/ DATE/ DRILL	/TIME : /TIME : ING MI	STARTE COMPLI STHOD	o <u>3/</u> med <u>3</u> -5-6	122/11 1/24/ 1/24/ 1/28/ Daly	11			
IN	TIGRAPHIC TERVALS ORDER OF DESCRIPTORS: IN 11/10 BG8 SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT SUPPLEMENTARY DESCRIPTORS			S A M P	S A M M P E L T		SPLI (REC	SAMP RECO T SPO CORD I RECO	ATION ORD ON BL	ows	ន	S I A N M T P E L R	F / D F D	C A H A L L S L S L S	G R A I N S I
R 0 M	A T	7	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P L E	I H N O G D	6"	6°	6"	6"	N	R	E V A L	(ppm)	L S	Ž
117		127	light gray Medium sand, loose slight oder										1.2		
127		147	light gray fine-medium squal 15:1t clay leases throughout										3.4		
147		167	tan brown + light gray fine- medium sand, loose slight odor										0.7		
167		197	light gray medium send, loose, slight odo-		-				_				1.6		F
197		207	light brown + light gray fine-medium sand, firm		-		-						0.0		F
207		227	light brown fine Sand & silt, firm, odor		-	1		_		 	+		0.0		\vdash
217		235	fan brown fine - medium sand, Goss, Some silt	_		-		-			-		5.4		H
235		247	clark gray / black silty clay, stiff						-	-			0.0		-
247		257	tan brown medium sand, some fine sand + silt, film DEPTH OF BOREHOLE CANNO DEPTH OF FIRST GROUNDWATER ENCOUNTER _	<u></u>		TOPS	OIL THIC	XNESS			<u></u>		1.6		
l	NOTES AND DMNEN	•	WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY L NOTES:	ength,	, and sa	MPLE II		<u>.</u>		-					

	PROJE	CT NUM	FD oks Rule ER G\$83 DRILLER DRILLER SURFACE ELEVATION SURFUL (A.M.) (P.M.)				DATE DATE DRILL CRA	DESIGNATION OF THE PERSON OF T							
IN' EPTHS	TIORAP TERVAL IN ft/	5	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S A M M P E L T		SPLI (RE	SAMP PENETI REC T SPO CORD 1	RATION ORD ON BL	OWE	S	S I A N M T P E L R	P/ IF	C A M E A L Y S I S L L S	G A I N
R O M	A T	T	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	NO	6"	8"	e.	VERIES	N	R	E V	I D (ppm)	LS	I Z E
57		270	orange brown medium sand, loose										2.4		
170		271	light boom silty clay, stiff	-									0.0		
71		285	Orange brown Medium sand, loose								-		5.4		
25		297	light gray fine sand + silt, firm										1.6		
97		303	light brown/gray mediumsami i loose	<u> </u>				_			_	<u> </u>	2.0		_
03		328	dorle gray / black silty clay, stiff	_					<u> </u>	<u> </u>			0.0		
28		342	light gray fine sand 45:14, firm			-		-					2.3		
342		347	light gray fine-medium sand, loose				_	 				-	0.8		
	347		END OF BORING				-	_			-		-		
		 		+	╁-	+	+	+							上
		•	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSO	OIL THIC	KNESS							
AND COMMENTS	NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY NOTES	LENGTH	, AND SA	NPLE IN	TERVA	-									



PROJECT NAME: Hooky Rulo	HOLE DESIGNATION: TW-3
PROJECT No: 683	
CLIENT: GSHI	DRILLING METHOD: 500.C
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5. Paly
	Sixtool Etwicol.
CONNECTION	GROUND SURFACE
AIR SUPPLY I	HEADER/ AIR SLIPPLY HEADER/POWER/CONTROLLINES
POWE	N
The last of the la	BOREHOLE Ø: 6" In
	GROUT TYPE: Cement/bentonite
	AIR INJECTION WELL Ø: /.25 In
	MATERIAL: black steel
	WATER INJECTION WELL Ø: in
190	MATERIAL: Sch 80 PVC
TOP OF SEAL AT: 190 ft BOTTOM OF SEAL AT: 195 ft	SEAL TYPE: Bentonite Chi.
TOP OF SCREEN AT: 200 ft	7155
BOTTOM OF SCREEN AT: 205 ft	AIR INJECTION WELL Ø: 1.25 in MATERIAL: 5/a: less steel
TOP OF SEAL AT: 2/0 ft	SCREEN: Ø: /.25 In SLOT SIZE: /6
BOTTOM OF SEAL AT: 2/5 ft	SEAL TYPE: Bentonite Chips
TOP OF SCREEN AT: 225 ft	
	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: /.25 in SLOT SIZE: /3
BOTTOM OF SCREEN AT: 235 ft	
TOP OF SEAL AT: 240 ft	SEAL TYPE: BENTONITE CHIPS
BOTTOM OF SEAL AT: 246 It NO GROUP	
TOP OF SEAL AT:ft	GROUT TYPE: NONE
BOTTOM OF SEAL AT: 255 ft	SEAL TYPE: BENTONITE CHIPS
TOP OF SCREEN AT: 260 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 265 ft 1	SCREEN: Ø: 1.25 in SLOT SIZE: 10
TOP OF SEAL AT: 270 ft	- 1
	SEAL TYPE: Bentonike Chips
BOTTOM OF SEAL AT: 347 ft	Sold in E. Sold in Course
CREEN TYPE: AIR:	Perforated
WATER: 🔼 Continuous Slot 🔲 F	Perforated Louvre Other:
CREEN MATERIAL: AIR: X Stainless Steel	PVC Other:
WATER: Stainless Steel	PVC Other:
OLE DIAMETER: 6" + 347' 7" + 287'	5 I 0
ULL DIMIVE ER. 4/ 1/ 31/ 1 1/ 1/ LD/	DURATION: 1, 25, 2 hr (250, 250, 750

	PROJ	ECT NUM	BER (0883 DRILLER SURFACE ELEVATION WEATHER (AM) (P.M.)	DRILER						HOLE DESIGNATION I W-4 DATE/THE STARTED 1/17/11 DATE/THE COMPLETED SCALE CRA SUPERVISOR S Daly									
STRATIGRAPHIC INTERVALS DEPTHS IN ft/m BGS			SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSUSTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS		S M M P E L T	(RECORD N-VALUES P E D								CHEMICAL NATESIS	G R J R S				
Ö	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	SAMPLE#	N O G D	6"	6"	6"	6.	N	R	L	(ppm)	LS	Ž				
0		2:3	No Log																
3		37	tan brown + dark brown medium course son! I gravel, fines, (fill) loose										0.0						
7		48	SAME					_					0,6						
3		5.7	light been fine-medium send, loose										0.0						
7		70	light brown + light gray medium sand, louse					_					0,0						
c		77	light brown fine sand, firm, some sile										0.0						
7		87	light brown fine sand some silt, firm					-	-				0.0						
57		97	light gray medium sand, loose										0.0						
1		105	ten brown + light gray Medium Send, loose										0.5						
NOTES AND			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINOTES:				, .		<u> </u>										



	PROJ	CCT NUM	STRATIGRAPHY LOG (OVERBURDEN) DRILLING CONTRACTOR BOOK LONGYOUT DRILLING CONTRACTOR						STARTI COMPL ETHOD VISOR						
STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS)		8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS			SAMPLE DETAILS PENETRATION RECORD SPLIT SPOON BLOWS (RECORD N-VALUES & RECOVERDS)					S I A T P I L R	P / D F D	C A NELLY SIL	G R I N 9	
ROM	A T	7	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	SAMPLE	I H N D G D	6"	8"	6"	8"	N	R	EV	D (ppm)	LS	I Z E
05		117	light gray fine sand 15:11, clay lenses, firm										1.1		
		137	light brown + light gray fine medium And										6.5		
3.7		15 7	light gray fine sand, some sill, firm, odor										2.5		
57		177	light brown + light gray medium sand, loose,										30		
			Some Sitt, Odor										2.5		
77		197	light bissin flight glay fine-medium sand slight odor loose										3.1		
רו		265	light brews elight gray median send , loose, odor										4.0		
.05		207	tan being time soudistit, time cky, fine, oder										3.5		
۲٦		227	ten brown + light gray fine sand & Sill, Some clay										3.5		
C	NOTES AND ONLIEN		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE			TOPSO									

	PROJ	ECT NUM	CLYSVILLE, NY WRATHER (AM) (P.M.)	RILLER RUHFACE ELEVATION FRATHER (A.M.) (F.M.)								HOLE DESIGNATION W - 4 DATE/THE STATED 1/17/1 DATE/THE COMPLETED 1/2-/11 DRILLING METHOD Senic									
EPTHS	TIGRAN TERVAL IN 11		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S). (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS			1							P/DFI	CHEMICA H T S I	G R A I N S						
R 0	A T	7	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	PLE	NO GD	8"	6"	6"	6"	N	R	E V	(ppm)	A I L S	I Z E						
127	<u> </u>	242	ton brown + light gray fine sand + sitt	Ė									5.6								
			Some clay firm, slight odo-																		
.42		247	ten brown medium sand, lock, oder	-			ļ						52.3								
- 12		291	THE DIENT MENTANCE THE PROPERTY OF THE PROPERT												<u> </u>						
247		251	tan brown medium Sand, lorge, odas										36								
5.1		270	tein brown & light gray fine Sand + Silf, firm, oder										38.8								
.7°		277	tan brown medium sand, looke odor										21.2								
277		282_	ten brown medium sand, losse, slight odo-	‡_									15.8								
282		290	light gray Silly Clay, St.fC., No oder										0,0								
290		297	ton bein tine-medium sun1, Clay laye-294-295		ļ		1	ļ					2.5								
		 -	film	+	1	\vdash	\vdash	┼	-		 -		 	<u> </u>							
291		307	NO RECOVERY - BROKEN CORE BARREL										-								
NOTES AND CONLENTS			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LEVEL SAMPLE RE					KHESS .													

-	ATIGRAF		E Horker Ruce DR BER (383 DR ISHIT SU CKSVIIIC NY WE SAMPLE DESCRI	(M.4) NCITE							S. (C A	G
INTERVALS EPTHS IN ft/m BGS SI GI			ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS			B M M P E L T		PENETRATION RECORD SPLIT SPOON HLOWS (RECORD N-VALUES & RECOVERIES)					S I A N M T P E L R E Y	P / P I D	HELLE	R
R O M	A T	Ť	NOTE: PLASTICITY DETERMINATION REQUIRES THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOIS	ADDITION OF MOISTURE IF THE TURE WAS ADDED OR NOT).	A WP L	I H N O G D	6"	8"	6"	6"	N	R	E V A L	(ppm)	ដំ នំ	I Z R
1.7		340	dork gray Silty alay , very :	54:62										0.0		
P		347	light gray fine-modium sand,	00st , Some 5:1+								!		0.2		
	347		END OF BORING													
							_									
								_								
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				· · · · · · · · · · · · · · · · · · ·			-		<u> </u>							
	<u> </u>	ļ			_					<u> </u>	_			ļ		<u> </u>
	 	 			\vdash		1			ļ	<u> </u>					\vdash
c	NOTES AND OXMENT	3	DEPTH OF BOREHOLE CAVING	AFTER HOURS		-		L THICK								

INJECTION WELL INS PROJECT NAME: Hooker Ruco PROJECT No: GS&3 CLIENT: GS H= LOCATION: Hicksville, NY	TRUMENTATION LOG HOLE DESIGNATION: IW-4 DATE COMPLETED: 1/27/11 DRILLING METHOD: Sonic CRA SUPERVISOR: S. Daly
CONNECTIONS TAIR SUPPLY HEAD POWER/ CONTROL LINE	AIR SUPPLY HEADER/POWER/CONTROL LINES
TOP OF SEAL AT: 215 ft BOTTOM OF SEAL AT: 220 ft TOP OF SCREEN AT: 230 ft TOP OF SEAL AT: 235 ft BOTTOM OF SEAL AT: 240 ft TOP OF SCREEN AT: 245 ft	MATERIAL: Sch & Pyc SEAL TYPE: AIR INJECTION WELL Ø: 1.25 in MATERIAL: Steel SCREEN: Ø: 1.25 in SLOT SIZE: 16 SEAL TYPE: Beatraile Chies PACK TYPE: SAND, SIZE #0 SCREEN: Ø: 1.25 in SLOT SIZE: 10
BOTTOM OF SCREEN AT: 255 ft	SEAL TYPE: SEAL TYPE: SEAL TYPE: PACK TYPE: SAND, SIZE #0 SCREEN: Ø: 1,25 in SLOT SIZE: 10
BOTTOM OF SEAL AT: 347 ft SCREEN TYPE: AIR:	SEAL TYPE: Bentonile Chips orated Louvre Other: Other: Plastic Other:
	Plastic Other:

<u></u>	LOCA	NT <u>C</u>	STRATIGRAPHY LOG (OVE BER 63 DRILLING CONTRACTOR BOECT LONG SHT SUBJECT BURNETON WEATER (AM.) (P.M.)	Yecr		1)	DATI DATI DRIL	S DESIGNATIONS OF THE PROPERTY	START COMPI	ETED 4	19/11 4-11 0 500	5	OF	<u>ਪ</u>	
813	RATIGRAI	PHIC	SAMPLE DESCRIPTION	·						DETAI				C 4	G
(DEPTH	IS IN ft,	m BGS	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTIONS	SAMPLE	8 M M P E L T	PENETRATION RECORD SPLIT SPOON BLOWS (RECORD N-VALUES & RECOVERIES)						S I A N M T P E L R	P / D F	CHEMICAL	r i n s
<u> </u>	T_	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	6"	6,	6"	6"	н	R	Ä	D (222)	រេន	Z
0		18	Some Fill Grevell, Aspect, Backchys, The						_	1	_	- "	(ppm)		E
	ļ		LI ROWN Figo of food card to Carrow grand com							 	<u> </u>		10.0		
<u> </u>			arading he secrement + For well around grave!				 	 	_	-	-	 			
		<u> </u>								\vdash	-	-			
18	<u> </u>	28	Lt Bourn Fine 7 medium sond & Fine 7 Garage			_	-		_	 	-		0.0		
			stoven su's Romait, Dry level			-				 		<u> </u>	0.0		 -
		<u> </u>	7,801			\vdash		-	_	 	-		0.0		<u> </u>
28	<u> </u>	37	L+ Brown medium bond my board			<u> </u>				 	 - -			 -	 -
	@ 35		Thin Blue gray clay Storn				-	-	<u> </u>	├	├	<u> </u>	00		
37		40	et Brewn very Fine Fine sand trace sice, day					-		 	ļ		 -		<u> </u>
1/0		54	It Brown and sond most - cret but							-	 	 	_		<u> </u>
	P×6	¢:	MEIS TO THE STATE OF THE STATE					-			├		000		<u> </u>
54		57	Black Clay very still plante most sent		<u> </u>			 							<u> </u>
57		60	IT Brown Fine - medic sond wet loose			\vdash	 				- -	<u> </u>	0.0	<u> </u>	
be		68	Yellowish Brown media = coors sond, wit bore			\vdash				 		 -	 		<u> </u>
635		フン	Yelkerizz Broken very const and + Fine			$\vdash \vdash$	-						0-e		
			Grevell, wet how					-		 	 	 	0.3		 -
													0.0		<u> </u>
															<u> </u>
			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER			TOPSON	THICK	NESS				L	L	لــــــا	
	NOTES		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS			TOP SUIL	- ITICA	nc33 <u> </u>							
	AND	3	NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LET NOTES:	(GTH, A	UND SAMI	PLE INTE	ERVAL								



	PEOJ	DOT NUM	HER COSS DRILLING CONTRACTOR BOOK COM HER COSS DRILLING CONTRACTOR BOOK COM CS HI SUBFACE REVAILOR WEATHER (A.M.) (P.M.)	3 Y"			DATE DATE DRIL CRA	DESIGNATION OF THE PROPERTY OF	STARE COMPL ETHOD VISOR	20 7 @ 7.	Zji.	-1			
TN	atigrai Itervai In H,		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	5 A	В В В			SAME PENETI REC TESPO	RATION ORD	1	S	S I A N M T P E L R	P /	CHALLY B	G R A I
P R O M	A T	T	GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	A P L	IT IH NO GD	6"		CORD RECO			R	P E R	D F	1 Y C 9 A 1 L 5	8 1 2
刻	<u> </u>	77	Stockhol Blegger 5.11 - 1+ Brown very An	_#_	U D	-	-		-		-	<u> </u>	(bhus)		E
			Sand This leaves to King 1/11 / Thack						-				-		
			Soft 7 Shef Lieb												
77		80	At Brown very Box Sond + Sich, wet												
0		93	Yellowen medium - Coope send Leve, wet										0.0		
43		45	CtBrown medion -> Fine Sond Loose well								_				
/5		97	Stranker Commen Blee som case tet Brown Sich												
			and crev fine sound south of the										0.0		
77		103	Stackhed Blue you place such ruley Ame Sond												
			Think 1/1"-144 spend our Red oxidizes som												
		<u> </u>	CEF		<u> </u>										
123		105	it Blue gay clay ploshe shell lut				l						@ *O		
25		105	Strenger The gray daying act today for sond		<u> </u>		<u> </u>	<u> </u>							Ĺ.,
			The x 46" > 1/4" sooms our Red oxides soms with				<u> </u>		<u>L</u>						
158		112	it see any clay proshe shift are		ļ	<u> </u>	<u> </u>						0.0		L_
112		120	- Statified Blue gray Clayer sect rulery knison sunt			<u> </u>		<u> </u>							
No		123	Brown Fire -> medium sand with sich love with	ļ		<u> </u>	ļ			L					
<u>የ</u> -ን		127	Strahlard Blue gray Cloyey schruey Bresond with		ļ	<u> </u>			L			ļ	0 ک		$\overline{\Box}$
			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER	L	<u> </u>	-		41500		<u> </u>	l	<u> </u>	<u> </u>	L	
;	Notes	WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSO	L THICH	INESS .								
C	AND DAMENT	78	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE NOTES:	NOTH,	AND SAM	(PLE IN	TERVAL					*			



STR	ATTGRA	PHIC	SAMPLE DESCRIPTION			ø	DRII	TIMG 1	COMPI CETHOD RVESOR	<u> </u>	U-1 OFE SI	I-U Bodme			
(DEPTHS									PLE I		IS	SPC-1C		I C A	_
F R O M	A	7 0	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS HOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IN MOISTURE)	9442	M M M P E T H		BPLI (RE	PENET REC T SPC	PATION CORD CON BI N-VAL VERIE	N LOWS 11729		S I A N M T P E L R	P / D F 1	H A L Y S	
127	147	137	Act Chevish very fine sond acc modish oxided and	-	G D	6*	6"	6"	8"	N	R	Å	(ppm)	L,S	
147			possible Destroy for sont occ political original sons			<u> </u>							04		
11-		167	4 Brown - Straush Berein very Rive of Riverson		<u> </u>	L									H
167		1327	Cotthe sich ove Redush on days												-
** +		181	1952 + Brain- grey brown & Rod midited begins				-						6 'es		_
.P81V	95		Civil 3 made and 1												
	-	767	177 MIX of very fine son's refluency cay stockhol		-			,							
197	-	203	- A MARKET LANG CHARLES A R. L.										a ~0		
20%		207	of Stown () South at 12 ft.												
	- 1	COF	The Section of the Section of sections	\dashv						_				_	
267	-	212		\dashv					\dashv						
212		217	Le doist Brown & 12	\dashv											
717		27	Thun Fine Davis and I to	_		-	-+						128		
17.7		237	11 2 MOND FINED Midle, SON) + SICH 1 -4	-				\dashv	\dashv	-+	-				
237		ul					-				-		0.0		
141		147	Redden Brown medin send loon, wet					-	+	\dashv					
प्रा		63	It Brown redice Sont			\dashv	7	_		-	-		2.4		
	\perp		Statifies my of very Rus souls - production souls				_	_+	-+	-+	-+	$- \downarrow$	18.7		
	_	D	PTH OF BOREHOLE CAVING	T		7	_	_	\dashv	-	-				
NOT	_	W.	THE LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS		то	PSOIL	HICKNE	33							
COMM	ints Ents	N	tel for each split—spoon sample, record glow counts, h—value, sample recovery lenc ies												

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9:1
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			DRILLING CONTRACTOR SON, CONTR	RBU	RDEN	₹)	DATI DATI	/TIME /TIME LING 1	GNATIO START COMPI CETHOD RVISOR	ED	υ/ 4. ζο ί ο	PAGE 7 - 5 -9-11 -11-11 Scrutt Ledmon	<u>4</u> or	<u>4</u>	
IN	TERVAL		SAMPLE DESCRIPTION						PLE I					C A	G
F R O	IN ft,	n BGS	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONFENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REGUIRES THE ADDITION OF MOISTURE IN THE	SAMPLE	S M M P E L T I H		SPLI (RE	PENET REC T SPC	RATION CORD CON BI N-VAL	OWS URS		S I A N M T P E L R	p / I P I	HNEALIY	R A I N
M	T	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	6"	6*	6"	6"	И	R		D	A I L S	I Z
263		27⊎	Redder Brown Finis median sons			_						1	(ppm)		E
770		275	Stretched very find media and + sich your not sol	eci C	,					\vdash			1.50	 	
77	i	300	HGroy-> Roddish Brown SICH > USI RM < OIL Stickles	141			-	_				<u> </u>	 -	 	
ac		30.1-	A Redien Brown Find productions continued					-	 	-			10.0		⊢
307		3/3	Stickles may at Boxes Schrelow & 1964 Rus end . Let allow										701-0		
3/3		324	Block Clay very short Dry-2 moust				 		-						 -
24		327	Libroun Sich erry lucy are said sherbus our												
			Ridden from oxidized some, redinself noise						_		_		 	 	
27		35/8-	UBrain & grayism Bon Using midsel					_	-					 	
			with sich are ledder from andre i degree						-				 		
-+			ast him						<u> </u>				 		
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L											_				
N	otes	ľ	EPTH OF BOREHOLE CAYING			TOPSON	. THICK	ESS _		!					
	MENTS CETNESS	Ì	ote: for each split-spoon sample, record blow counts, N-value, sample recovery len otes:	GTH, A	ND SAMP	LE INTE	RYAL								
		1													

	STRUMENTATION LOG
PROJECT NAME: Hower - Rus	
PROJECT No: 683	
CLIENT: CSHI	DRILLING METHOD: Seric
LOCATION: Hicksula Jy	CRA SUPERVISOR: 2. Red min
CONNECTIONS AIR SUPPLY HEAPOWER CONTROL LINI TOP OF SEAL AT: 45 ft TOP OF SCREEN AT: 220 ft TOP OF SCREEN AT: 25 ft TOP OF SCREEN AT: 25 ft TOP OF SCREEN AT: 27 ft BOTTOM OF SEAL AT: 1 ft TOP OF SEAL AT: 27 ft BOTTOM OF SCREEN AT: 27 ft BOTTOM OF SEAL AT: 30 ft TOP OF SCREEN AT: 30 ft TOP OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft TOP OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft TOP OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft TOP OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft BOTTOM OF SCREEN AT: 30 ft	GROUND SURFACE AIR SUPPLY HEADER/POWER/CONTROL LINES
DOTTORIO OLALAT. JTV II MRNSSN RESERVE	
SCREEN TYPE: AIR: X Continuous Slot Performance WATER: Continuous Slot Performance SCREEN MATERIAL: AIR: X Stainless Steel WATER: Stainless Steel HOLE DIAMETER: 418' 7" + 217'	rated Louvre Other:
DEVELOPMENT: METHOD: A: 1.61	DURATION:
06883-D22101(SOURCÉ)GN-WA001 OCT 21/2010	

	PRO	ect num Ne	(35 H.T. SURFACE BLEVATION			· · · · · ·	DATE DRILL CRA	TIME ! /TIME ! /TIME (ING ME SUPERV	COMPLI THOD TISOR	25 25 25	11/11 . De		-	C A I	G
110	PHS IN #/m BGS A T 0 1 23 3 30	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DESSITY/CONSISTENCY, GRAIN SURE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S	A M M P E L T I H		SPLI (REC	ENETH RECO I SPOO CORD I RECO	ATION ORD ON BL	OWS URS	٥	S I A N T P E L R	P/ DF D	H A L C B L C A L S	RAIN	
ů M	A T		NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	£	N O G D	6"	6"	6"	8"	N	R	Î	(ppm)	r s	Z
0		23	No recovered soil												_
23		30_	Oscange-bishin Mediconse should agreed, some										0,0		
30		37	light gray fine sand 15. A firm										0.0		
<u>3</u> 7		57	light gray fine sant+sill, firm										0.0		
57		77	tan brown , light gray medium sand, love										6.0		
77		97	light gray-fresence, clay leases 93-941										0, 0		E
<u> ۹٦</u>		102	light brown flow squitsilf								-		0.0		
02		120	dark gray Sitty Clay, Very Stiff										0.0		
120		131	tan being fine med signer clock, stight sweet odor			-		a rioc			_		0.3		上
	NOTES AND MUEK		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN DREN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINDTES:				IL THICK								



Jan 14 11 01:33p	
Hicksville Biosparge	
1 (516) 822-1874	

	PROJ	ect numi P	REPORT AND DESCRIPTION BOOK FOR THE CONTRACTOR BOOK FO				DATE DATE DRILL CRA	TIME: TIME: TIME: SAMP	TARTE COMPLI THOD TBOR	ETED				C A	G (
IN SPTHS	TIGRAF IBRVAL IN ft/	.8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(3) - PRIMARY COMPONENT(3), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A W P	S M M P E L T I H		SPLI (RE	PENETI RECO T SPO CORD I	ATION ORD ON BL	SWO.	<u>.</u>	S I A N M T P E L R	P / D F D	HELYSIA	R I N S		
R O M	A T	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Œ E	N O G D	6"	6"	6*	6"	N	R	L_	(ppm)		Z E	1	
בו		(57	light gray fla Signer, slight orlar	-								-	1.0				
5.7		177	light gray five-med sand loose	1_									0.3				
						ļ							111		ļ	1	
77		197	reddish brown med Sand, love no oder	+	+	-	-		-	-	\vdash	 	1.4		 		
57		227	tan beaun fine - pred sand . tirm , no ode		‡								0.7				
27		247		士					_				1.5				
		-	slight odor	-	-	╀			-	1	+-	┼	-	-	1 -	Ì	1
47		257	tan brown time-mai sand, love no oder					-		1	-		1.2	-			
57		277				F		1					23.7			-at	265
			no cdo-		_	╁─	-	+	┼-	+	+	ļ	9.1				1219
ינינו		297	tan brown mad sand, loosa	_	1	-							17.1		\models	- a -	235
		+		+		+-	-	+	1	 		<u> </u>	1,31.			1 "	" "
·	NOTES	•	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNT WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS:			TOPSO	OIL-THIC	KNESS									
	WOTEN.		NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVE NOTES:	RY LENGTH	i, and 5/	MPLE IN	ITERVAI	L									

	LOCA	TION	DRILER SURFACE ELIVATION SICKS VII & WRATHER (AM) (F.M.)				DATE DEILI CRA	/TIME S /TIME C LING ME SUPERV	COMPLE THOD _ ISOR _	TRD	Де ју	111			
DEPTH F R	ATIGRAI NTERVAI S IN ft,		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S M M P E L T		EPLI (REC	SAMPI PENETR RECO T SPOO CORD N RECOV	ATION IRD IN BLO	WS JES	S	S I A N M T P E L R	P / D F I D	CHEMICA THATHS	G R I N S
Ņ.	A	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF TO SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Œ E	N O	6"	6"	в*	6"	N	R	E V	(ppm)	LS	I Z E
97		307	tanbrown Highl gray medium sand, loose										27.2		<u> </u>
h*7		2200	V												
07		320	light gray fine sand + sitt. firm clay lenses	+									2.8		
20		327	light gray fine medium Sand loose	_	 								18.2		
				\top									10:2		\vdash
<u> 27</u>		347	light gray fine-medium sand, large										6.6		
-	347		end of boring		-			_	_						_
	-		ena of Doring	+-	\vdash							-			
					j ·								 		
		 		- -	 								<u> </u>		
					 . 			\vdash				ļ	 	 	<u> </u>
									\dashv					 	-
	<u> </u>														
	 			+	ļ										
	NOTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTED WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS:	-	1	TOPSOIL	. THICK	NESS _				<u> </u>	<u> </u>		
C	ESTON AND CHEMINIC		NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVER NOTES:	y Length,	and sam	PLE INT	ERVAL			· · · ·				,	

PROJECT No: 68€3 TDAT CLIENT: 65HI DRII	UMENTATION LOG DE DESIGNATION: IW-6 ATE COMPLETED: 1/17/11 RILLING METHOD: 500 C. SA SUPERVISOR: 500 C.
CONNECTIONS TO AIR SUPPLY HEADER/ POWER/ CONTROL LINES	GROUND SURFACE AIR SUPPLY HEADER/POWER/CONTROL LINES
TOP OF SEAL AT: 245 ft BOTTOM OF SEAL AT: 250 ft TOP OF SCREEN AT: 255 ft BOTTOM OF SCREEN AT: 260 ft TOP OF SEAL AT: 265 ft	BOREHOLE Ø: 6 + 7" in GROUT TYPE: Portland communt/bentonite AIR INJECTION WELL Ø: 1.25 in MATERIAL: Sch & PVC WATER INJECTION WELL Ø: 1.25 in MATERIAL: SEAL TYPE: Bentonite Chip AIR INJECTION WELL Ø: 1.25 in MATERIAL: 5+cel SCREEN: Ø: 1.25 in SLOT SIZE: 10
BOTTOM OF SCREEN AT: 278 ft BOTTOM OF SCREEN AT: 275 ft	— SEAL TYPE: Benton to Chie — PACK TYPE: SAND, SIZE #0 — SCREEN: Ø: 1.25 in SLOT SIZE: 10
BOTTOM OF SHALAT:	— SEAL TYPE: $NONE$
TOP OF SEAL AT: 290 ft BOTTOM OF SEAL AT: 205 ft TOP OF SCREEN AT: 305 ft TOP OF SEAL AT: 310 ft	— SEAL TYPE: Bentonte Chip — PACK TYPE: SAND, SIZE #0 — SCREEN: Ø: 1.25 in SLOT SIZE: 10
BOTTOM OF SEAL AT: 347 ft	- SEAL TYPE: Bentanite Chip
SCREEN TYPE: AIR: Continuous Slot Perforated WATER: Continuous Slot Perforated SCREEN MATERIAL: AIR: Stainless Steel PVC	
WATER: Stainless Steel PVC HOLE DIAMETER: (" + 0 347' 7" + 0 517' DEVELOPMENT: METHOD: Air lift	Other: DURATION:

	LOCA	NT C	BER C883 DRILLER SHE SURPACE ELEVATION SCREWILL, NY WEATHER (A.M.) (P.M.)				DATE	TIKO A	COMPL ETHOD	ED _3 ETED 3	संदर्भ संदर्भ	Δi			
EPTH:	ATIGRA VTERVA B IN It		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S A M M P E L T		SPL (re	PENETI REC IT SPO CORD	RATION ORD ON BI N-VAL	OWS	LS	S I N T P E L R	P / 1 P I	C A H N E A L I Y C A	G R A I N
R O M	A	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE HAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	6"	8.	BECO	6"	א (פ	R	E V A L	(ppm)	LS	I Z E
0		37	tight brown medium- coarse Sand + gravel, some fine sand + 5:14, 10054										0.0		
3 7		50	light brown modium - consc sand + gravel, some fine sand + silt	<u> </u>									0.0		
50		57	Zeso' light brown fine rend + silt, firm	<u> </u>									0.0		
57		77	light brown + light gray time sand + Sill firm		-					<u> </u>			0.0		
77		100	light gray flow sand still, firm										0,0		
00		114	derk gray /black silty clay, Stiff										0.0		
[[4		117	tan brown fine- medium sand, loose								<u></u>		0.5		
117		127	light brown medium sand, some fine sand+ silt, loose										0.0		
27	-	137	light gray medium sand, loose				_						0.5		
c	NOTES AND OMMEN		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY L NOTES:							<u> </u>	<u> </u>		I		



	LOCA	т <u>С</u> 11 могт	eksy.'lle, Ny weather (am)				DRIL	LING M	ETHOD	ETRD	216	ļu			
ĬΝ	TERVAL	FIGRAPHIC TERVALS ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE			S M M P E		SPL)	PENETI REC IT SPO	RATION ORD ON BI	OWS	LS	S I A N M T	p /	C A H N E A M L I Y	G R A I N
F R O M	A T	TO	GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	A P L E	I H I H N O	6.	(RE	RECO	N-VAL	UES	R	A N M T P E L R	D F I D	I Y C S A I L S	8 1 Z
31		147	light gray medium sand, loose	#-	G D					-		L	(ppm) 0.7		E
47		161	light gray + tan brown fine-medium sand, loose										1.4		
67		177	tan brown medium sand, loose										0.2		
77		187	tan brown medium sand, loose										0.4		
87		197	fan brown medium sand, losse										0.5		
97		217	tan brown fine medium sand some silt, film										2.6		
217		221	for brown flac- medium sand, some silt, filma										[.4		_
127		242	fan brown fine-medium Sand Samo Silt, firm										0.2		_
242		247	light gray silty clay, Stiff										0.0		
147		257	DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER_			TOPSOL	71/0	(UEC-C					1.7		
	notes		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			IUPSU	LIMA	ESS _							
	AND DMMENT	rs	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINDIES:	ENGTH,	AND SAM	IPLE INT	ERVAL.								

	CITIK	Mr 🗠	Cakevile, UY WEATEER (AM.) (P.M.)				DATE DATE	I/TIMB I/TIMB LING M	STARTI COMPL COMP	ETKD	<u>3/21</u> 1 i'c	//! ///			
IN	ATIGRAI ITERVA 3 IN ft		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRAINTON/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A W P L	S A M M P E L T		SPL (RE	PENET REC IT SPC CORD	RATION CORD CON BI N-VAL	ows Ues	LS	S I A N M T P E L R	P / 1 P I	C A H N E A L I Y C S	G R A I N
ς Σ7	Ť	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ė	I H N O G D	6°	6*	6.	6"	N	R	E V	(ppm)	A I L S	Z E
													0.2		
61		277	tan brown medium sand, loose, clay layer e 273-276	+		ļ							1.4		
.71		297	tan brown medium sand, some fine sand, loose, odu	1									16.4		_
97		307	tan brown medium sand, loose		ļ								6.2		
67		330	light gray & tan brown fine sand some medium sanderill										5.7		
3υ		347	Fooldish brown medium sand , loose										0.9		
_				\vdash							-				
				-			_								
	NOTES AND DIMMENT	is.	DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—YALUE, SAMPLE RECOVERY NOTES		. <u>.</u>	TOPSOL		I CNESS .			l				

PROJECT No: 6883 CLIENT: GSHI	RUMENTATION LOG HOLE DESIGNATION: TW-7 DATE COMPLETED: 3/29/11 DRILLING METHOD: 5-Nic CRA SUPERVISOR: 5- Daly
TOP OF SEAL AT: 255 ft BOTTOM OF SEAL AT: 260 ft TOP OF SCREEN AT: 270 ft TOP OF SCREEN AT: 51 ft BOTTOM OF SEAL AT: 51 ft TOP OF SCREEN AT: 51 ft BOTTOM OF SEAL AT: 51 ft TOP OF SEAL AT: 51 ft TOP OF SEAL AT: 51 ft BOTTOM OF SEAL AT: 51 ft TOP OF SCREEN AT: 290 ft BOTTOM OF SCREEN AT: 300 ft BOTTOM OF SCREEN AT: 300 ft BOTTOM OF SCREEN AT: 305 ft	GROUND SURFACE AIR SUPPLY HEADER/POWER/CONTROL LINES BOREHOLE Ø: 6 In GROUT TYPE: Partland Cement/bentonite AIR INJECTION WELL Ø: 1.25 In MATERIAL: 5-4 80 PVC SEAL TYPE: Bentonite Chips AIR INJECTION WELL Ø: 1.25 In MATERIAL: 5-4 80 PVC SEAL TYPE: Bentonite Chips SCREEN: Ø: 1.25 In SLOT SIZE: 10 SCREEN: Ø: 1.25 In SLOT SIZE: 10 SEAL TYPE: NONE SEAL TYPE: None SEAL TYPE: SAND, SIZE #0 SEAL TYPE: SAND, SIZE #0 SCREEN: Ø: 1.25 In SLOT SIZE: 10 SEAL TYPE: SAND, SIZE #0 SCREEN: Ø: 1.25 In SLOT SIZE: 10
TOP OF SEAL AT: 310 ft BOTTOM OF SEAL AT: 347 ft	SCREEN: Ø: 1.23 IN SLOT SIZE: 10
SCREEN TYPE: AIR:	ed Louvre Other:

	CLIR	NT _ (BET 6.383 DETILING CONTRACTOR SIGN AS STATE SURFACE REPORTOR SURFACE REPORTOR SURFACE REPORTOR FRATHER (AM.) (P.M.)				DATE DREL CRA	/TIME /TIME LING 10 SUPER	COMPLI ETEOD VISOR	T	nic Daly				
EPTE:	<u> </u>	S No BGS	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLIMENTARY DESCRIPTORS	S A M P	S M M P E L T		SPLI (REC	SAMP REC T SPO CORD T RECO	RATION ORD ON BL N-VAL	OVE	S	S I A N M T P E L R	P / 1 P I D	C AN ALYSIS	G R A I N S I
Ŭ M	A T	O T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	Ñ O G D	6"	6"	6"	6"	N	R	Å L	(ppm)	LB	Z
<u>o_</u>		16	tan brown from - medium sound, some silt										0.0		
		-	and rouse sand		-	_	_			\vdash					
ic_		26	tanbrown medium-cearse gard, some silt	\vdash				 					0.0		
															Ī.
26		36.	tan boson Medium-loanse sand trill										0.0		
36		50	SAME										0.6		_
50		56	light tan fine sand, this cky lens @53'										0.2		
56		60	light tan fine sand										0.0		
60		72	-grayish brown clayey silt								_		0-0		
71		10	light gray fine sand	-	├—	 	_	├—	├	├			0.5		_
<u>:</u>	-	10	ALEGE ALCIA (CAR DESA S	 	<u> </u>	1	1	1	┢	\vdash			(1, 6	 	
16		96	light gray fine sand, erange layers										0,0		
C	NOTES AND DIMENT	3	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINDIES:									L	<u></u>		

	PROJ	NT	SELSU (LE, AY WEATHER (AM.) (PM.)	1; yee			DATE/T DATE/T DEILLI CRA S	TIME : TIME (NG MI VPERT	COMPLI ETHOD VIEOR	50 <u>7/</u> E7ED	Dale	o			
IN	ATIGRAF NTERVAL S IN ft,	PHIC LS /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (MATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURES, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	й S	8 M M P B 1 T		PI SPLIT (RECC	RECO SPOI	MOITAN CINO LIE NO LIAV-N	OWS UES	s	S I A N T P E L R	P /	CH ALL CALL	G R A I N
E 0	A T	7	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P L E	1 T 1 H N D G D	6"	` & 1	RECO	VERIES 8*	S) N	R	L R E V	D F	Å I L S	8 1 Z
3		NO.	/ light gray fine Sand, arange layers	†	ų ν							L	(ppm)		E
60		108	donle gray to black silty clay, very stiff	 									0.0		
8		113	light fan Silty Clay, Stiff	†			H						6.0		
13		116	tan tyray fine sand, thin orange layers	<u> </u>		 							0.0		
4		127	tan gray fine send, thin orange layers	1									1.6		
17		1129	light gray silty Clay, stiff	#	 								0.0		
29		136	black/durk gray silty clay, very still	丰				_	_				0.0		
36.		142	SAME	1				<u> </u>					0,0		
12		146	light gray than sand + silt, trace clay	 									0.0		_
46	<u> </u>	153	dark gray black 5:1t, claye very Stiff	+	-	+-	+	-	\vdash	\vdash	\vdash		0.0		
	notes and ondent	NG .	DEPTH OF BOREHOLE CAVING				IL THICKN	ESS _	<u> </u>						

	LOCA	MT_CON_H	BRILING CONTRACTOR BOOK LC. BRILING CONTRACT				DATE, DETLI CRA	/TOMB ING M SUPPER	V180R .	50.	1/21/ nic Daly				
D		LS /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	SAMP	B M M P E L T I H		SPLT (REC	ENETE REC C SPO CORD 1	RATION	OWS	S	S I A N M T P E L R E V	P / D F D D	C A H A L Y C A L S	G R I N S I
Ň	Ä	O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	I H N C G D	6"	6"	67	6"	N	R	, L	(pprp)	L S	Ż
53		15%	tan brown + gray 5: 1ty Cky, stiff			_		_					0.0		<u> </u>
િ	·	176	ton bown Medium sand, losse										3.1		
6		179	ten brown fine-predium sand, some silt										2.5		
79		131	light brown + light gray silt + fine sand										0.0		
31		196	ton brown medium sand, trace fine sand toilt										0.9		
6		211	light fan tgray fine Sand wesilt										0.7		
7		227	tan brown med sund of some line sand + silt										0.5		
27		23 5	Orange - beam medium conese Short										0.8		
33		237	tan chayey silt wi orange brown mottles										0.0		
31		240	tan clayey gilt wil ofenog brown matter DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER_										0.2		
3	NOTES AND		DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS:			IOPSOI	L THICK	NESS _							

SAMPLE Gw. 6883-092410-50-601 Collected from 300'

·	LOCA	TION	A STATE SUBSTICE ELEVATION [4:ck5ville, A) Y YEATHER (A.M.) (P.M.)				CRA S	OPER	VISOR .	Je S.	Dely				
IN DEPTHS	ATIGRAI ITERVAI 3 IN 1t,		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE STMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SER/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONYENT, SUPPLEMENTARY DESCRIPTORS	S A M P	M M A P B		PI	NET REC	RATION	OYS	<u> </u>	S I A N M T P E L R	F /	C A H B A L Y C B	G R I N
F R O M	A T	T	MOSTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	l t.	LT 1H NO GD	6"	6"	BECO	VERIE:	S)	R	P E L R E V	I D D (maqq)	C S A I L S	S I Z E
240		257	tan brown fine-med sand thin light gray										0.3		
25 7		270	tan brown tine - Med sand + sift	+									0,0		
a70	-	973	tan brown + gray silty clay stiff										0.1		
273		277	tark gray/black sitty clay, very stiff	1									0.0		
177		286	ton brown + gray 5: Ity clay, stiff										0.0		
250		297	tan brown fine-medium sand+5ilt	#									0.0		
297		305	light gray fine sand										0-0-		
305		312	light gray fine sand toilt, arange mottles										0.0		
312		317	donk gray/black silty clay, very stiff	1									0.2		
	NOTES AND NOTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY NOTES				L THICKN	ESS _	<u> </u>			<u> </u>			



5 Ample Gw. 6883-092410-50-002 Collected from 350'

	PROJ	ect muli	SER DRILLING CONTRACTOR SER DRILLER SURFACE ELEVATION WEATHER (A.M.) (F.M.)				DATE/ DRULL CRA S	TIME TIME ING M WPER	STARTE COMPLI PIHOD VISOR	D					يردن
110	ATIGRAI ITERVAI 3 IN 11	LS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, BUPPLEMENTARY DESCRIPTORS	S A M P	S A M M P E		P. SPLN	ENET REC	RATION ORD ON BL	OW8	S	S I A N M T P E L R	P /	I Y R Y H N	G R A I N
F R O	Å	T O	GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMELE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	T.	LT IH NO GD	6"	(REC	RECO	N-VAL VERIE:	UES E)	R	L R E V	D F I D (ppm)	Y C S	S I Z E
317	_	321	light gray time sand +silt wi dark gray clay										ار الای		
322		331	light gray fine sond 15ilt										8.5		
33:1		341	SAME	oos									6.2		
347		367	light gray fine squelt silt wy trace clay	002			-				_		16.7		
357		361	light gray fine sand, orange mother										12-7		
367		37%	tan + gray fine sand										2.8		
378		385	light gray Silty clay, stiff										1.2		
385		394	Cark gony/ black silty clay, very stiff			-							0.0		
394		397	light gray finsand +5:11										1.3	_	
	NOTES AND OMMEN	ŀ	DEPTH OF BOREHOLE CAVING					HESS .	<u> </u>				<u> </u>	L.—.	

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	ALTON	T	4.5 (1-1) SURPACE ELEVATION WEATHER (A.M.) (F.M.)				DATE DRILL CRA	/TIME ING MI SUPPER		7 S.	Daly	10		C A I	- 6 -7
EPTHS F R	ATIGRAP ITERVAL 3 IN ft/	S m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLIMENTARY DESCRIPTORS	SANPLE	S M M P E L T I H O G D		SPLI (REC	PENETI REC T SPO CORD 1 RECO	ON HIA N-VALU VERIES	OWS JES		S I N T P E R P E V A	P / D F D	HELYSIS	R A I N S I Z E
ů.	Å T	Ď	NOTE: PLASMCTTY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).		ĜĎ	6"	6"	6"	6"	N	R	ī	(ppm) 0, 3		Ē
97		405	light gray fine sand +silt	003		\vdash			Н				0.3		
	ļ	428	light gray + fan brown Med , coarse Sand, thin	+-									6.2		
105		720_	Clay leases @ 412-415, Some sitt												
428		435	light gray + tan brown med - coarse sand, some sitt		<u> </u>	-							0.5		
	ļ			824	├								1.2		
435	├	450	reddish brown fine-melium soul	- 100,	 	<u> </u>		-					-		
	450	-	END OF BORING												
						_		<u> </u>							
		<u> </u>		-	 	┼		<u> </u>	\vdash	-			╀	├	\vdash
	 	ļ. —		+-	 			╁╌	-	\vdash	-			 	\vdash
					†				 						
	 	 													
												 	 	 	
					┼	ļ	<u> </u>		1	-		<u> </u>	-	 -	├ —┤
	<u></u>	<u> </u>	DEPTH OF BOREHOLE CANNG DEPTH OF FIRST GROUNDWATER ENCOUNTER		1	TOPSOL	L THIC	KNESS	<u></u>	<u> </u>	L	.—		1	
C	NOTES AND COMMENT		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:										············		

INJECTION WELL INS PROJECT NAME: Hooker Ruco PROJECT NO: 6883 CLIENT: GSHT LOCATION: Hicksville, NY	HOLE DESIGNATION LOG HOLE DESIGNATION: TW-15 DATE COMPLETED: 10/6/10 DRILLING METHOD: JONIC CRA SUPERVISOR: S. Daly
TOP OF SEAL AT: 343 ft BOTTOM OF SEAL AT: 348 ft TOP OF SCREEN AT: 355 ft BOTTOM OF SCREEN AT: 360 ft TOP OF SEAL AT: 361 ft	AIR SUPPLY HEADER/POWER/CONTROL LINES BOREHOLE Ø:
BOTTOM OF SEAL AT: 366 ft	SEAL TYPE: Bentonite Chips PACK TYPE: SAND, SIZE #O SCREEN: Ø: 1.25 In SLOT SIZE: 10 SEAL TYPE: Bentonite Chips GROUT TYPE: Cement/bentonite/pea grave! SEAL TYPE: Bentonite Chips PACK TYPE: SAND, SIZE #O SCREEN: Ø: 1.25 In SLOT SIZE: 10
<u></u>	SEAL TYPE: Bentenite Chips forated



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-16

DATE COMPLETED: November 2, 2005

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	~	-1	SAM	T	_
BGS	GROUND SURFACE	AMSL 121.58		NUMBER	INTERVAL	REC (%)	N' VALUE	
			NCJI			L	Z.	L
	SILTY SAND, trace gravel, light brown, no odor		FLUSHMOUN' CASING		4			
			FLUSHMOUN CASING WITH CONCRETE SEAL			1		
-5	SAND AND GRAVEL, medium to coarse sand, fine	115.56	SEAL		4	1		
-10	gravel, dry, light brown and red brown, no odor				3			
10								
-15					4	3		
"	SAND, trace silt, medium grained sand, light brown,	105.58						
-20	molst, no odor		CEMENT/					
20			CEMENT/ BENTONITE GROUT		4 4	1		
-25					4	4		
	- trace gravel at 26.0ft BGS							
-30			1"0 SCH 40 STEEL RISER		4444444			
						3		
-35		85,56	1"0 SCH 40 STEEL RISER					
	CLAY, trace silt, stiff, dark brown	uu,uu	1°0 SCH 40 STEEL RISER 1°0 SCH 40 STEEL RISER					
-40								ĺ
					4			
-45		75,58			4	.i		
	SAND, fine grained, light brown, moist, no odor	7 0.00	170 SCH 40 STEEL STEED		2			
-50			1"0 SCH 40 STEEL					
			RISER					
-55		65.56						
	CLAY, high plasticity, dark gray, wet, no odor							
-60		60,56			4			
	SAND, medium grained, tan brown, moist, no odor		174 SCH 90		4			
-65	- fine to medium grained sand, wet at 66.0ft BGS		1"0 SCH 80 PVC RISER		<u>;</u>	1		
	- mile to injuriant granica early from at account 200							
-70								
-70 -75			CONTRACTOR					
-75	- light gray, clean, saturated at 76.0ft BGS]		
	g g							
-80					4 4			
1			NOT THE PROPERTY OF THE PROPER		4 2			
85								
				}				



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: November 2, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

HOLE DESIGNATION: IW-16

LOCATION: HICKSVILLE, NY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	-	T .	SAMF		
II BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (mon)
-95 -100	- gray at 96.0ft BGS				444444			0.
105	- trace coarse sand, gray and brown at 106.0ft BGS		CEMENT/ BENTONITE GROUT					
-110	- clay lens from 112.0 to 114.0ft BGS							0.
115	- light brown, saturated at 116.0ft BGS							
-120 -125			1'0 SCH 40 STEEL RISER		શેસસેસ સંસંચ્યા			0.
-130	- medium grained sand, light brown and orangish brown at 126.0ft BGS							0.
-135 -140	CLAY, stiff, dark gray, no odor	-14.44	1°0 SCH 40 STEEL RISER					•
-145	- trace silt at 146.0ft BGS		A CANADA ANA ANA ANA ANA ANA ANA ANA ANA AN					0.
-150			1"0 SCH 80 PVC RISER		रासास्य सामान्या			0.
-155 -160	SAND, loose, fine to medium grained, light gray and orangish brown, no odor	-34.44	TOWN TOWN TOWN TO THE PROPERTY OF THE PROPERTY		.स्य.च.च.			0.
-165	- light brown and light gray at 166.0ft BGS		NAMES AND ASSESSED OF THE PROPERTY OF THE PROP					
-170 -175			A CANADA AND AND AND AND AND AND AND AND AN					0.
	TES: MEASURING POINT ELEVATIONS MAY CHANGE; I				4 4		·	



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-16

DATE COMPLETED: November 2, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST		т. т	SAMP		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (nom)
185	- slight sweet odor at 186.0ft BGS				यस्य विस्तर्भास्य स्थानस्य स्			0.
-190 -195	- light brown, sweet odor at 196.0ft BGS				ज.च.च.च.च.च. ज.च.च.च.च.च.			3.
200	- light brown, sweet oddr at 130.00 000		CEMENT/ BENTONITE GROUT		<u>स्त्राच्याच्य</u>			0.
205	 light gray and orangish brown, thin clay lenses, no odor at 208.0ft BGS 				या या या या			
-210 -215	- loose, orange brown at 216.0ft BGS		1"0 SCH 40 STEEL RISER		ज्ञानाचा <u>न</u> ज्ञानाचा न			0.
-220			STATE OF THE PROPERTY OF THE P		य य य			0.
-225	- trace clay at 226.0ft BGS				र स्थान			
-230	SILTY CLAY, light brown and gray	-108.44	1"0 SCH 40 STEEL RISER					
-235	- light gray at 236.0ft BGS							0.
-240			1*0 SCH 80		ज्ञासस्य स्थानस्य स्			
-245	SAND, trace silt and clay, stiff, fine to medium grained sand, low plasticity, slight sweet odor, light gray orangish brown	-124.44	PVC RISER		<u>स्तर्थस्य</u> स्वयं स्वयं			
-255					4344444444			0.
-260 -265					य य र			
200	- tan brown, sweet odor at 268.0ft BGS							



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-16

DATE COMPLETED: November 2, 2005

DRILLING METHOD: 6" ID ROTASONIC

-275		AMSL		l iii	\$	8	그	ł
-275				NUMBER	INTERVAL	REC (%)	'N' VALUE	
-275					3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			4
	OLAW Held ways an older	-155.44			1 1			
-280	CLAY, light gray, no odor SAND, fine grained, light brown, orange mottles, no	-158.44			1 1			0
	oder				2			0
-285	 medium grained sand, light brown, sweet odor at 288.0ft BGS 				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
-290			CEMENT/ BENTONITE GROUT		.च.च.च.च			0
-295								
-300	- loose, gray at 300.0ft BGS		1"0 SCH 40		4			
-305			1"0 SCH 40 STEEL RISER		यस्य			3
-310					यय:			
-315	- tan brown, slight odor at 316.0ft BGS				1 41.	:		
-320			1"0 SCH 40 STEEL RISER					
325			37.7.2.3.3 37.7.2.3.3 37.7.2.3.3 37.7.2.3.3		स.स. स.स.स			0
330			1		रूप: इ.स.च			
-335	- fine to medium grained sand, trace clay and silt, brownish gray, no odor at 336.0ft BGS		1°8 SCH 80 PVC RISER					
340					12° 12°			3.
345					4 4			
350	- loose, medium sand, gray, slight odor at 350.0ft BGS							14
355		-235.44			4 4			
	CLAY, trace sand and silt, stiff, fine grained sand, dark gray IES: MEASURING POINT ELEVATIONS MAY CHANGE; R							



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DRILLING METHOD: 6" ID ROTASONIC

IW-16

DATE COMPLETED: November 2, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S.DALY

HOLE DESIGNATION:

LOCATION: HICKSVILLE, NY

ELEV. SAMPLE DEPTH STRATIGRAPHIC DESCRIPTION & REMARKS INJECTION WELL NEST ft AMSL ft BGS 'N' VALUE (mdd) INTERVAL NUMBER શ REC (즲 0.0 365 -244.44 SAND, loose, medium grained, tan brown 5.5 -248.44 370 CLAYEY SAND, trace silt, firm, light gray 0.5 375 BENTONITE CHIP SEAL -256,44 380 0.0

SAND AND SILT, fine grained sand, light gray #1 SILICA SAND -385 - firm, sweet odor at 386.0ft BGS 390 IW-16D1L SCH 80 PVC WELL SCREEN 15.8 395 IW-16D1A STAINLESS STEEL WELL 400 -279.44 SCREEN SILTY CLAY, firm, light gray BENTONITE CHIP SEAL 0.0 405 -284.44 SAND, fine to medium grained, light brown and light gray 1°0 SCH 40 410 0.3 STEEL CEMENT/ 415 BENTONITE -loose, medium grained, light brown, trace gray at 416.0ft BGS WITH 3/8" 0 PEA GRAVEL 15.8 420 BENTONITE CHIP SEAL - fine to medium grained, reddish brown, no odor at 425 425.0ft BGS IW-16D2A STAINLESS STEEL WELL SCREEN 14.7 430 #1 SILICA SAND 435 S. 0.3 -440 BENTONITE CHIP SEAL 883. - light brown and gray at 445.0ft BGS 445 0.0 OVERBURDEN LOG

MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-16

DATE COMPLETED: November 2, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	CTRATICE ARMIC DESCRIPTION & DEMARKS	ELEV.	INJECTION WELL NEST	<u></u>		SAM	PLE	
ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	AMSL	AUGUSTON PIECE NEOT	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
-455 -460 -465 -470 -475 -480 -485 -490 -495 -500 -505 -510 -515 -520 -525 -530 -535	END OF BOREHOLE @ 450.0ft BGS STRATIGRAPHY OF IW-16 FROM MW-83	-328.44	WELL DETAILS Screened interval: -263.44 to -278.44ft AMSL 385.00 to 400.00ft BGS Length: 15ft Diameter: 1in Siot Size: 10 Material: SCH 80 PVC Seal: -253.44 to -258.44ft AMSL 375.00 to 380.00ft BGS Material: BENTONITE CHIPS Sand Pack: -258.44 to -279.44ft AMSL 380.00 to 401.00ft BGS Material: #1 SILICA SAND	N.	LNI	RE	,N,	JId .



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: IW-17

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DATE COMPLETED: November 30, 2005 DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST			SAM		
ft BGS	GROUND SURFACE	AMSL 121.75		NUMBER	NTERVAL	REC (%)	N' VALUE	
							Ż	i
-5	SAND AND SILT, with gravel, loose, fine to medium grained sand, fine grained gravel, light brown, no odor		FLUSHMOUN CASING WITH CONCRETE SEAL		य य य य			
-10 -15			NAMES OF THE PROPERTY OF THE P	Of	च च च च च	1		1.
-20			CEMENT/ BENTONITE GROUT SEAL					
-25 -30				02				3.
-35		85,75	1" Ø SCH 40 STEEL RISER		4 4			0
-40	CLAY, trace silt, firm, light brown SILTY CLAY, firm, light gray and dark gray	84.75	1" Ø SCH 40 STEEL RISER		2 2			0.
-45	SAND, loose, medium grained, tan brown	76.75		03	સર્વાસ સર્વાસ સરવાત્રાસ			
-50			1° 0 SCH 40 STEEL RISER		स.स.स. स.स.स			1.
-55	- trace fine sand and silt at 57.0ft BGS	62.75			.स.स.स.स.स.स.स.स.स. १ स.स.स.स.स.स.स.स.स			0.
-60	SILTY CLAY, compact, dark gray	02.73			4.4.			0.
-65	SAND, loose, fine to medium grained, light brown	54.75	1" 0 SCH 80 PVC RISER	04	40 4 4 4 4 4 4			
-70	GAIAD, 10026, lists to medicili grassed, sgrit brown				17 17			0.
75	- medium grained, trace fine grained sand at 77.0ft BGS				4344444444 4344444444			
-80					यस्य			
85				05				1.



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-17

DATE COMPLETED: November 30, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	~		AMPL		~
K BG5		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
-95					य:ब:ब:इ ब:ब:ब:इ			
-100	- tan brown at 97.0ft BGS				बस्य स			
-105			CEMENT/ BENTONITE GROUT SEAL	05	<u>स्त्रस्य</u>			2.
-110 -115					सःसः सःसः			
-120	- trace silt at 117.0ft BGS		1" 0 SCH 40 STEEL RISER		यस्य स			
-125 -130	- dark brown layer from 130.0 to 136.0ft BGS			07	यस्य स			1.
-135		-15.25	1°0 SCH 40 STEEL RISER		यस्य स्थान्य स स्थान्य स्थान्य			
-140	SILTY CLAY, stiff, dark gray				रसस्य एससम्ब			
-145 -150			1" 0 SCH 80 PVC RISER	08	स.स.स.स स.स.स.स			0.
- 155	A Control PolyAge and	-35.25			स्टब्स् स्टब्स्			
-160	SAND, loose, fine to medium grained, light tan and light gray, slight sweet odor							
-165 -170			NATIONAL DE LA COMPANSIONAL DE L	09	444444			4.
175	- tan brown and light gray, sweer odor at 177.0ft							
NC NC	BGS OTES: MEASURING POINT ELEVATIONS MAY CHANGE;					L		



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-17

DATE COMPLETED: November 30, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST			Τ	PLE	
BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
185				10				4.2
195	 trace silt, trace clay, firm, fine grained, light brown, sweet odor at 197.0ft BGS 		CEMENT/ BENTONITE					
205			GROUT SEAL	11	सम्बद्धाः			3,
215	SAND AND SILT, trace clay, firm, fine grained sand, light brown, sweet odor	-95.25	1" 0 SCH 40 STEEL RISER		.च.च.चच.च			
220	igit blotti, checkers.			12	संस्थान व			5.
230	CLAY, trace silt, stiff, dark gray	-115.25	1°0 SCH 40 STEEL RISER		र र र र			
240	CLAT, liace Sill, Sull, Valk gray		1" 0 SCH 80 PVC RISER		ર ર ર ર			0.
250	SAND AND SILT, trace clay, firm, fine grained sand, tan brown	-126.25	PVC RISER					o.
255 260	SAND, loose, fine to medium grained, tan brown, sweet odor	-135.25						
265				14	4444			14



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-17

DATE COMPLETED: November 30, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST			SAM	r i	
ft BGS	STRATIGRAPHIC DESCRIPTION & REINFILLO	AMSL		NUMBER	NTERVAL	REC (%)	'N' VALUE	PID (ppm)
			RRRR			-	_	
					4			
-275					7			
	- trace silt, medium sand at 277.0ft BGS				4			
-280					4 44 4 4			
- 285	- SILTY CLAY, light gray layer from 285.0 to 286.0ft				2 2			
200	BGS			15	4			23
-290			→ CEMENT/					
-290			BENTONITE GROUT SEAL			•		
			I ANAN		4			
-295	- medium grained, reddish brown at 297.0ft BGS				1 1	1		
	- modern grands, reason as a second							
-300					4			6.
				`	4 5			
-305	- tan brown at 305.0ft BGS			16		1		
				"				10
-310					4 4			
	SAND AND SILT, fine grained sand, light gray							1.
-315				•		1		
	SILTY SAND, trace clay, firm, fine grained sand,	-195.25				1		
-320	light gray, orange mottles	-199.25	I AAAA			1		
-325					4 4			
		ŀ	BENTONITE CHIP SEAL	17	4			2.
-330			O III SLAL					
		ļ			4			
-335		•			4 6			
	NO RECOVERY	-215.25						
-340	NO RECOVER I		#1 SILICA SAND		iet le			
- 240			 			1		.
245			SCH 80 PVC WELL	18				N/
-345	·		SCREEN IW-17D1A		4			
		-228.25	STAINLESS STEEL WELL		4 4			
-350	SILTY CLAY, stiff, light gray, no odor	-220.23	SCREEN BENTONITE					
			CHIP SEAL	19				0.6
-355		-235.25			2 3			
<u></u>	SAND, firm, fine to medium grained, light gray,	-235.25						
	orange mottles OTES: MEASURING POINT ELEVATIONS MAY CHANGE;		V P P P P P P P P P P P P P P P P P P P		14	'ا		



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: IW-17
DATE COMPLETED: November 30, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	<u> </u>		SAME		
t BGS	SHOOT NO SECOND NOT THE	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
					1 1			
365				20	1			
370	SILTY CLAY, firm, light gray	-248.25			1			
375		-255.25			4			İ
380	SAND AND SILT, trace clay, firm, fine grained sand, light gray	-200.25			444			
385			CEMENT/ BENTONITE GROUT WITH 3/8" 6					2.3
390	SAND, trace silt, loose, fine to medium grained	-268.25	PEA GRAVEL SEAL	21				:
195	sand, light gray, sweet odor				4			26.
	- light brown at 397.0ft BGS		1"6 SCH 40					
100			STEEL RISER		4.4.			
105				22	7 4 4			2.9
410			BENTONITE CHIP SEAL					
115	- trace fine grained sand, light gray at 417.0ft BGS							
120			#1 SILICA SAND IW-17D2A STAINLESS		1 1			5.8
125	at 400 00 DOS		B STEEL WELL SCREEN	23	स.स	4		
130	- medlum grained sand, tan brown at 428.0ft BGS							9.5
135								
140	firm, fine to medium grained sand, reddish brown, no odor		BENTONITE CHIP SEAL					İ
145				24				4.2
	OTES: MEASURING POINT ELEVATIONS MAY CHANGE;			<u> </u>	4			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-17

DATE COMPLETED: November 30, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	ļ		SAM		
ft BGS	STATISTAFILIO DESCRIPTION & REMARKS	AMSL		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
455	END OF BOREHOLE @ 450.0ft BGS	-328.25	WELL DETAILS Screened interval: -213.25 to -228.25ft AMSL 335.00 to 350.00ft BGS		_=_			
460			Length: 15ft Diameter: 1in Slot Size: 10 Material: SCH 80 PVC Seal:					
-465 -470			-203.25 to -208.25ft AMSL 325.00 to 330.00ft BGS Material: BENTONITE CHIPS Sand Pack: -208.25 to -228.25ft AMSL 330.00 to 350.00ft BGS Material: #1 SILICA SAND					
-475 -480			Screened interval: -223.25 to -228.25ft AMSL 345.00 to 350.00ft BGS Length: 5ft Diameter: 1in Slot Size: 10					
-485 -490			Material: STAINLESS STEEL Seal: -203.25 to -208.25ft AMSL 325.00 to 330.00ft BGS					
-495			Material: BENTONITE CHIPS Sand Pack: -208.25 to -228.25ft AMSL 330.00 to 350.00ft BGS Material: #1 SILICA SAND					
-500 -505			Screened interval: -298,25 to -303,25ft AMSL 420,00 to 425,00ft BGS Length: 5ft					
-510			Diameter: 1in Slot Size: 10 Material: STAINLESS STEEL Seat: -288.25 to -293.25ft AMSt.					
-515			410.00 to 415.00ft BGS Material: BENTONITE CHIPS Sand Pack: -293.25 to -307.75ft AMSL					
-520 -525 -530			415.00 to 429.50ft BGS Material: #1 SILICA SAND					:
-530								
- 535								
NO.	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO	CURRENT ELEVATION TABLE			•		



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	· · · · ·	T	PLE	
n BGS	GROUND SURFACE	AMSL 121.49		NUMBER	REC (%)	N' VALUE	(maa) Gld
					<u> </u>	Ż	PID
	TOPSOIL TOPSOIL	121.32	FLUSHMOUN				
	SAND AND GRAVEL, some slit, loose, fine to medium grained sand, orange-brown, no odor		FLUSHMOUN' CASING WITH CONCRETE SEAL		1		0.0
-5			WITH CONCRETE SEAL	4]		
				4 4			
-10							_
							0
-15				ع و			
			CEMENT/	1 1			
-20			CEMENT/ BENTONITE GROUT	4 4			
			BENTONITE GROUT	4 4			0
-25							
-25							
	SAND AND SILT, trace clay, firm, fine grained, light	93.49	CEMENT/ BENTONITE GROUT 1"0 SCH 40 STEEL RISER				
-30	gray and orange			4 4			
							0
-35			1"6 SCH 40 STEEL				
	- ioose, tan brown, no odor at 38.0ft BGS		RISER	2 4			
-40				4 4		1	
				4 4			
-45	•			4 5			
-50			1"0 SCH 40				
			STEEL RISER	4 4			
-55							
55	`	co 40				1	
co	SAND, loose, medium grained, tan brown and	63.49		4 4			
-60	grayish brown						0.1
		E0.40	474 504 40			İ	
-65	SILTY CLAY, stiff, light gray	56.49	1°6 SCH 80 PVC RISER	4 4			0
	- dark gray at 67.0ft BGS				ļ		
-70				उन्यस्त्रस्य सम्बद्धाः इन्यस्त्रस्य सम्बद्धाः			0
				इ.स.च.च	-		
-75		45.49					
	SAND, loose, medium grained, tan brown - fine to medium grained sand, light tan, no odor at						0.1
-80	78.0ft BGS						
		İ		4			
-85				4			
				H H			0
NO	TES; MEASURING POINT ELEVATIONS MAY CHANGE; RE	EER TO C	TIRRENT ELEVATION TABLE				



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	-	T	SAM		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(maa) (Jid
-95					1 1 1 1			
100					2 2			ĺ
			CEMENT/ BENTONITE GROUT		2 4			
-105			CEMENT/ BENTONITE GROUT		2 2			
-110					2 1			
-115	- medium grained sand, tan brown at 118.0ft BGS							
-120	- meaning granted same, tall broatt at 110,011 500		170 SCH 40 STEEL RISER		141			0
-125	SILTY CLAY, compact, dark gray, no odor	-3.51						
-130					4.4.4			1
-135			1°8 SCH 40 STEEL RISER		रसन्			
-140	- stiff at 138.0ft BGS		STEEL RISER		1 1		:	
-145								(
			17a SCH 80		य या			
-150	SAND AND SILT, loose, fine to medium grained,	-30.51	1°0 SCH 80 PVC RISER					
-155	light gray		A SA CASA A SA C		4 4			f.
-160 -165								1.
-165	SAND, loose, fine to medium grained, tan brown	-42.51	NAMES OF THE PROPERTY OF THE P		4 4			
-170					संस्थानस्य स्थानस्य br>स्थानस्य स्थानस्य स्			2.
-175								
-170 -175	TES: MEASURING POINT ELEVATIONS MAY CHANGE;				4 4			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST		SAMPL	
ft BGS		AMSL		NUMBER	<u> </u>	'N' VALUE
-185					1	1
-190		-68.51		4444444		
	CLAY, trace slit, light brown			E E		0
-195	SAND AND SILT, trace clay, firm, fine grained, light	-76.51		2 2 2 2		
-200	brown		CEMENT/ BENTONITE GROUT			3
-205				132		
-210	SAND, loose, fine to medium grained, light brown	-88.51	1"8 SCH 40	4 4		
-215	- tan brown at 218.0ft BGS		1"0 SCH 40 STEEL RISER	4 4		
-220	Car Storm St 15.01 500			133		
-225				111		2.
-230	SILTY CLAY, stiff, dark gray	-108.51	170 SCH 40 STEEL RISER			
-235				1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
-240	- no odor at 238.0ft BGS		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	य य		C
-245	SAND AND SILT, trace day, firm, fine grained sand,	-124.51	1"0 SCH 80 PVC RISER	- - - - - - - - -		
-250	tan brown and light gray			र्ब द इ.स.		
-255		400 54		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
-260	SAND, loose, medium grained, tan brown, sweet odor	-136,51		यस्य स्वयं स्वयं स्वयं		
265				4 4 4		4.:



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST		Т	SAMI	, T	
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
					4 4			
-275					2			
-280					3,3,3,3			0.2
-285	SAND AND SILT, firm, fine grained sand, light gray and orange, sweet odor	-163.51						
-290			CEMENT/ BENTONITE GROUT		444			2.6
-295	SAND, loose, fine grained, light gray, sweet odor	-173.51						2.7
300	 trace silt, firm, fine to medium grained sand, light gray, sweet odor at 300.0ft BGS 							
-305			1"0 SCH 40 STEEL RISER		4 4			2.1
-310					4			2.4
315		-196.51						
-320	SAND AND SILT, firm, fine grained sand, gray, sweet odor		170 SCH 40 STEEL RISER					
-325					1 1 1			
-330					4 4			
-335	SAND, loose, fine to medium grained, light gray, sweet odor - medium grained, tan brown, sweet odor at 338.0ft	-212.51	1°0 SCH 80 PVC RISER					12. 10.
-340	BGS		BENTONITE CHIP SEAL					
-345 -350			CHIP SEAL		444			13.
-350								42.
-355			#1 SILICA SAND IW-18D1L SCH 80 PVC					36.8



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	SAMPLE					
t BGS	STATISTATIO DESCRIPTION OF THE PARTY OF THE	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)	
365 370	- clay lens from 363.0 to 364.0ft BGS - SAND AND SILT, trace clay, firm, fine grained sand, gray from 366.0 to 377.0ft BGS	-244.51	WELL SCREEN IW-18D1A STAINLESS STEEL WELL SCREEN BENTONITE CHIP SEAL		4433333			15	
375 380	- no odor at 372.0ft BGS SAND, loose, medium grained, tan brown, sweet odor		1"0 SCH 40 STEEL RISER						
385 390 395			CEMENT/ BENTONITE GROUT WITH 3/8* 0 PEA GRAVEL		રન હત્વ હત્વ			5.4	
400 405 410	 fine to medium grained, light gray, no odor at 400.0ft BGS 		BENTONITE CHIP SEAL					2	
415 420	- medlum grained, light tan at 413.0ft BGS							0.0	
425	- medium to corase grained, orange brown at 424.0ft BGS		W-18D2A STAINLESS STEEL WELL SCREEN		. स.स.स.			1.6	
430 435	SAND AND SILT, firm, fine to medium grained, light brown and gray	-307.51	──#1 SILICA SAND			1		4.	
140	SAND, loose, medium grained, light reddish-brown, no odor	-316.51	BENTONITE CHIP SEAL					3.	
45	NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; F	REFER TO C	CURRENT ELEVATION TABLE					<u> </u>	



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-18

DATE COMPLETED: January 6, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	The state of the s	ELEV.	INJECTION WELL NEST			SAMI	PLE	
ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	AMSL	INJECTION WELL NEST	NUMBER	NTERVAL	REC (%)	N' VALUE	PID (ppm)
-455 -460 -465 -470 -475 -480 -485 -490 -500 -515 -510	END OF BOREHOLE @ 450.0ft BGS	-328.51	WELL DETAILS Screened interval: -228.34 to -243.34ft AMSL 349.83 to 364.83ft BGS Length: 15ft Diameter: 1In Slot Size: 10 Material: SCH 80 PVC Seal: -218.51 to -223.26ft AMSL 340.00 to 344.75ft BGS Material: BENTONITE CHIPS Sand Pack: -223.26 to -245.51ft AMSL 344.75 to 367.00ft BGS Material: #1 SILICA SAND	NUMB	INTER	REC	TVA.IV.	d) Q1d
-525 -530 -535								
-530								
535 NO								



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PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: IW-19

PROJECT NUMBER: 6883

DATE COMPLETED: January 11, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	~	T 1	SAMF		
BGS	GROUND SURFACE	121.09		NUMBER	NTERVAL	REC (%)	N' VALUE	
			FLUSHMOUN' CASING WITH CONCRETE SEAL		4	_	5	
0	SAND AND GRAVEL, trace silt, loose, fine to medium grained sand, orange-brown, no odor, stones to 0.5" diameter,	115.09	FLUSHMOUN' CASING WITH CONCRETE SEAL	01	44444			(
0	- medium to coarse grained sand, orange-brown, cobbles to 1 st diameter at 16.0ft BGS		CEMENT/ BENTONITE GROUT SEAL		<u> </u>			(
0 —	SAND, firm, medium grained, orange, no odor	91.09		02	य.स.स.स. स.स.स.स.स			,
0	SAND AND SILT, loose, fine to medium grained sand, orange brown, no odor	85,09	1" Ø SCH 40 STEEL RISER 1" Ø SCH 40 STEEL RISER					2
5	SILT AND CLAY, firm, light gray, no odor SAND AND SILT, firm, fine grained sand, light gray	76.09 75.09	1" Ø SCH 40 STEEL RISFR	03	kararar Kararar			(
5	CLAY, some silt, firm, light gray	67.09	1" 0 SCH 40 STEEL RISER					0
o	- trace silt, light gray to dark gray at 56.0ft BGS			-				(
5 0	SAND, loose, medium grained, light tan and orange	53.09	1" 8 SCH 80 PVC RISER					
5	- trace silt, light tan at 76.0ft BGS		TOWN TOWN TOWN TOWN TOWN TOWN TOWN TOWN		. स्टब्स्य स्टब्स्ट्स्ट्र . स्टब्स्य स्टब्स्ट्रिक्ट्र			C
)	- light gray at 84.0ft BGS		CANADA CA		.च.च.च			C



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-19

DATE COMPLETED: January 11, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST		T	SAM		
ft BGS	OTTOTAL THE BESONE TION & NEW WIND	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
-95	- trace fine grained sand from 96.0 to 116.0ft BGS							0.0
-100 -105			CEMENT/ BENTONITE GROUT SEAL	06				2,7
-110 -115	- light brown at 116.0ft BGS				1 1 1 1			
120			1" Ø SCH 40 STEEL RISER		.स.स.स.स			0.1
125	- trace silt, compact, dark gray at 125.0ft BGS			07				0.1
130	- firm, light gray at 129.0ft BGS				44			0.5
135	- loose, light gray and dark gray at 136.0ft BGS		1" © SCH 40 STEEL RISER		4 4 4			
-140 -145				08				2.2
-150					444			
- 155	- fine to medium grained sand, light gray at 156.0ft BGS		PVC RISER		44.4			
- 160						•		
-165				09				1
-170 -175	·					•		
113					2 2			1.2



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-19

DATE COMPLETED: January 11, 2006
DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	ļ		SAME		
BGS	STRATIONAFINO DECOMM FIOR CITIZENS	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
185	CLAY, stiff, dark gray	-60.91		1				0.
95	SAND, fine to medium grained, light gray	-78.91	CEMENT/ BENTONITE GROUT SEAL					O. O.
210	SILTY CLAY, soft, light brown	-83.91		11	ब ब ब ब ब ब			О.
215	SAND, trace slit, firm, fine to medium grained sand, tan brown	-94.91	1* 0 SCH 40 STEEL RISER	12				3.
230 -	CLAY, with silt, firm to stiff, tan brown to dark gray	-108.91	1" © SCH 40 STEEL RISER	12				o
240	SILTY CLAY, stiff, dark gray	-114.91	20000000000000000000000000000000000000		व व व व व			0
245	SAND, firm, fine grained, light gray and orange, no odor	-125.91	1º 0 SCH 80 PVC RISER	13	יו ויי	7		1.
260	- trace silt, loose, medium grained sand, trace fine grained sand, light brown and light gray at 256.0ft BGS			14				0.



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-19

DATE COMPLETED: January 11, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	-	T . T	AMPLE	
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	PiD (opm)
-275	- loose, medium grained sand, reddish brown at 274.0ft BGS - light brown at 276.0ft BGS				4.3.3.4.3.4.3.4.3.4.3.4.3.4.3.4.3.4.3.4		0.8
-280					ग्य य		
-285				15	च च च		2.
-290			CEMENT/ BENTONITE GROUT SEAL		.च.च.		
- 295					4 44		
-300	·				स्यार		
-305				16	च च च		4
-310					स्य		
-315	 clay lens, light gray from 314.0 to 315.0ft BGS with sit, loose, fine to medium grained, light gray at 316.0ft BGS 				4.44.4		
-320					44		3.
-325	CLAY, stiff, dark gray	-203.91		17			
-330			BENTONITE CHIP SEAL		सस्य		1.
-335	SAND AND SILT, fine grained sand, orange-brown and gray - SAND, medium grained sand, light gray and light	-212.91 -214.91	GAIL SEAL				2.
-340	pink, sweet odor at 336.0ft BGS				17 17		10.
-345			#1 SILICA		4444		
-350	loose, trace fine grained sand, trace silt, tan brown		SAND IW-19D1L				
-355	,		SCH 80 PVC WELL SCREEN W19D1A STAINLESS	19	<u> </u>		12.



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-19

DATE COMPLETED: January 11, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST		T .	SAMF	1	
R BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
			STEEL WELL SCREEN		4 4			
-	SILTY CLAY, stiff, light gray	-241.91	BENTONITE CHIP SEAL					0.2
365	SAND AND SILT, loose, fine to medium grained sand, tan brown	-243.91			4 4			24.6
370	 trace clay, firm, fine grained sand, light gray at 370.0ft BGS 				1111			ı
375				20	1			2.5
380	SAND, loose, medium grained sand, light reddish brown	-258.91			<u> </u>			5.1
385	- trace fine grained sand at 385.0ft BGS				4			
390			CEMENT/ BENTONITE GROUT SEAL	1				12.9
395	- light gray, sweet odor at 393.0ft BGS			21				35.0
ł								
400	 with silt, with fine grained sand, loose, light brown at 400.0ft BGS 		1" 0 SCH 40 STEEL RISER		1			
405				22	44.			20.
-410		:	BENTONITE	"				
-415		-295.91	CHIP SEAL		4			:
Γ	NO RECOVERY							
-420			IW-19D2A STAINLESS					
-425			STEEL WELL SCREEN	23	1			N/A
-430								
-435		-315.91			1			
-440	SAND, loose, fine to medium grained sand, reddish brown, no odor		BENTONITE CHIP SEAL					:
-445				24	4			11.1
					1 1			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: IW-19

DATE COMPLETED: January 11, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	INJECTION WELL NEST	-		T	PLE	
ft BGS	STATISTATIO DECOME FOR A TELL AND	AMSL		照	\\	8		(muu) Cla
				NUMBER	INTERVAL	REC (%)	N' VALUE	5
				Ž	Ζ	m	Ž	<u> </u>
-	END OF BOREHOLE @ 450.0ft BGS	-328.91	WELL DETAILS					
-			Screened interval: -223,91 to -238,91ft AMSL				1	
- 455			345.00 to 360.00ft BGS	.			1	
:	•		Length: 15ft Diameter: 1in					
460			Slot Size: 10					
			Material: SCH 80 PVC Seal:					•
- 465			-206.91 to -215.91ft AMSL					
-			328,00 to 337,00ft BGS Material: BENTONITE CHIPS					
-470			Sand Pack:					
: "			-215.91 to -239.41ft AMSL 337.00 to 360.50ft BGS					
- 475			Material: #1 SILICA SAND					
-475 -			Screened interval:					
- 1			-233.91 to -238.91ft AMSL 355.00 to 360.00ft BGS					
_480 			Length: 5ft					
			Diameter: 1in Slot Size: 10					
-485			Malerial: STAINLESS STEEL					
:			Seal: -206,91 to -215.91ft AMSL					
-490			328.00 to 337.00ft BGS					
:			Material: BENTONITE CHIPS Sand Pack:					
- 495			-215.91 to -239.41ft AMSL			İ		
			337.00 to 360.50ft BGS Material: #1 SILICA SAND					
-500			Screened interval:					
			-298.91 to -303.91ft AMSL	1				
-505			420.00 to 425.00ft BGS Length: 5ft					
: "			Diameter: 1in					
-510	•		Slot Size: 10 Material: STAINLESS STEEL					
-510		·	Seal:					
:			-288.91 to -293.91ft AMSL 410.00 to 415.00ft BGS					
-515			Material: BENTONITE CHIPS					
			Sand Pack: -293.91 to -308.91ft AMSL					
-520			415.00 to 430.00ft BGS Material: #1 SILICA SAND					
			INGUING IT GILLON ON TO					
-525								
-530								
-535			;					
			į					
		DEFECTO TO	NIDDENT ELEMATION TARSE	LL		I		
<u>NO</u>	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	KEFER IU	SURVENI EFEAUTION TABLE					

	PRO CLIE LOCA	MT	STRATIGRAPHY LOG (OVE BER 6993 CSSHT SUPPLIES GEOMETRICON SUPPLIES GEOMETRICON WEATER (AM) (P.M.)	RBU	RDEN	1)	DATE DATE DRIL	/TDATE	START COMPL PTHOD	20	vje olali	0	: or		
	RATIGRA NTERVA		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:	SAMPLE DETAILS										C A	G
F R O	₩ 1 0 0 \\7 7 \\37	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	S M P L	SAWET LE	A M M P B L T		SPLI (RE	PENET REC T SPO CORD 1 RECO	ORD ON BI N-VAL	OWS UES		S I A N M T P E L R	P / 1 / D F I D	H N L S	A I N S
0	 -	t —	CARPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	ì	N O G D	8"	6"	6"	6"	N	R	A L	(ppm)	נים	Ž E
	 	1	tan brown medium-coarse sand Egravel		<u> </u>								0.0		
			silt, dry	_	_	<u> </u>						<u> </u>			
17		37	tan brown med. coarse Sand + graves							ļ	<u> </u>	<u> </u>	<u> </u>		
<u> </u>			with silt . Orange mottles		├	-					⊢		0.0		<u> </u>
<u> </u>			B156-47 (104)23	_	-		_				-		 		
37		5 p	reddish brown medium sand up fine		-	_	\vdash	_			 	 			 -
-	<u> </u>		Sand + Sil+			-				┢		_	0.0		
<u> </u>	2.9	-	WATER TABLE			 			_		<u> </u>	-	 		
<u>50</u>		57	light gray Fine-medium sand trilt										0.0		
57		77	light gray fine-medium sand +5:1+										<u> </u>		
			76-77 I rapt gray sitty clay stire		<u> </u>	<u> </u>		-		_		<u> </u>	0.2		
			The gray stity chan, shift		-								0.0		
77		957	tan brown fine-medium sand		_					-	 	 			
		34											0.,		
94									_				 -		
34		90	light gray Silty clay, Stiff										0.0		
		_	NOTU OF TOORIGE ALLEGO										0.0		
	NOTES AND		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSOIL	THICK	ess _			_				
C01	MARKETS		note: For each split-spoon sample, record blow counts, N-Value, sample recovery len Notes:	IGTH, A	ND SAMP	LE INTI	RVAL.			-			•		

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Hicksville
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	PROJ	ect nu nt	STRATIGRAPHY LOG (OVE BER 6883 GSHZ HICKSYILL NY STRATIGRAPHY LOG (OVE DRILLER CONTRACTOR BOCAT LOA DRILLER GENERICATION SURFACE REPARTON (P.M.)	yea		•	DATE DATE DRIL	/TIME	16121	20	<u>&</u>				
11	ATIGRAI VIERVAI	19	SAMPLE DESCRIPTION					is	CA	a					
P R C	3 IN M.	N N/m BGS SOIL SECCE GRAM MOIS NOT! O SAM 94 [N 117 [i] 122 [i]	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE RAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	S A M M M P M P L T			SPLI (REC	PENET REC T EPC CORD	RATION ORD ON BI N-VAL	ewo.		S I A N T P E L R E V	P / D F I D	C A H A L Y C A L S	R I N S
1 ₀				E	N O G D	6"	6"	6"	8"	N	R	L	(pp#g)	LS	Ž
,,,		74	light gray fine sand		_		Ţ						0.2		
14		97	light an oill ob oil o												
			light gray silty clay, stiff			_				<u> </u>			0.0		
17		117	light gray fine- medium sand	-									ļ <u>. </u>		<u> </u>
			The water Sand	-			-	_					0.3		
רי		122	light gray fine- medium gand							-		-	0.0		
22		30.00								-			0.0		
<i>LL</i>		125	tan brown fine-medium sand, some Sitt										0.1		
25		13-	light arou fine medium sand												
_			light gray fine medium sand										0.1		
37		Sz	light gray fine- medium sond	-+											
			J. T. T. T. T. T. T. T. T. T. T. T. T. T.					\dashv					٥٠٥		—
<u> 50</u>		152	tan brown Fine- medius sand + silt		_		_	\neg							
52								-	_	_			0.1		}
22		157	light gray fine - medium Sand										6.6		
5 -		177											OLD		
_			DEPTH OF BOREHOLE CANNO DEPTH OF FIRST GROUNDWATER ENCOUNTER_			_				,			0.2		
	OTES		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:		1	TOPSQIL	THICKN	ess _					1		-
COL	and Doents		note: for each split—spoon sample, record blow counts, N—Value, sample recovery len <u>notes</u> :	GTH, A	ND SAMP	LE INTE	RVAL.	_							

STR	ATIGRA	PHIC	SAMPLE DESCRIPTION	DATE/THE COMPLETED DEILING METHOD Senic CRA SUPERVISOR S. Daly SAMPLE DETAILS											
P R O	IN ft.	/m BGS	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT. SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED DE NOT).	S A W P L	A M X P E L T I H		SPL (RR	PENET	RATIOI ORD ON BI	LOWS	מו	S I M T P E L R	P / I F I P	C A H A L Y S A L S	1 1 1 1
77	<u> </u>	185	SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OF NOT).	E	G D	6"	6*	6*	8"	N	R	Ä	(ppm)	LS	2
		102	light gray Fine-median sand, loose	<u> </u>	-			<u> </u>		<u> </u>			0.1		
88		187	light gray silty clay, stirs	├	-			_					<u> </u>		L
			,					-		_			0.c		_
37		197	dark gray/black sitty clay, very stiff	厂	_		 			<u> </u>			0.0		
17		213							-			_	0.0	<u> </u>	
`		<u> ~1.2</u>	dark gray / block 5: Hy Clay , Very Stiff										0,0		
3		217	tan brounfine medium sand + silt	<u> </u>				_							
			THE BLOOM LIVE WAYN DAY FRIT		ļ								0.1		
7		230	tan brown fine-medium sand, some six	\vdash	 										
\dashv			gray Mottles	 		-				_			0.3		
\dashv															
2		334	light gray silty clay, stiff										0.1		_
34	$\neg \dashv$	237	15.44										<u> </u>		
		~2 /	light gray fine suns + silt , firm	L				_]					0.5		
					-			_							
\bot						_									
			EPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER_			TOPSOIL	Piloro								
	TRS	ľ	ATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTERHOURS			IUPSUIL.	Inickk	IESS							



1	PROJECT CLIENT LOCATIO	r NUM	DRILLING CONTRACTOR BOAT A DRILLING CONTRACTOR BOAT A DRILLING CONTRACTOR BOAT A SURFACE REPATION WRATER (AM) (P.M)		-a-		DATE DATE DRILL CRA	DESIGNATION OF THE PROPERTY OF	STAKII COMPL STHOD TSOR	D	ovely	10/10		<u>=</u>	
F R	GRAPHI RVALS N ft/m		SECONDARY COMPONENTS, RELATIVE DENSITY CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L E	M M P E L T		SPLI (RE	PENETE RECO T SPOO CORD I RECO	ATION ORD ON BL	OWS	S	S I A N M T P E L R E V	P / 1 P 1 D	CHEMIC ALBIE	GRAIN N
37	- -	57	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO HOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	•	G D	6"	6"	6"	6"	N	R	Ĺ	(ppm)		Z E
+	-		this clay leaves throughout	1_									J		
1	2	77	light gray + tan brown Marble fine sand tit										0.1		
1	2	27	tan brown medium and , loose	-									0.4		
1	3	04	tan brown medium send, loose										3.3		
上	3	08	light gray silty clay, stiff						_				2.1		_
	3	18	Orange brown Medium San classe, Sweet ador										6.6		_
+	3	25	light gray fine sand + silt, oder										7.5		_
	3	38	light gray tradish brown fine soult 5.11										5.0		
	+	\dashv	Sweet ador												_
	3	48	ton brown Markin in SUN (1005)										1.5		
NOTE AND COMME			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY NOTES:			TOPSOI		ness _			-	_			

STER	CTT	ENT <u>Ci</u> Ation <u>A</u>	FICK SV//4-, AVY WEATHER (A.M.) (P.M.)				DATE DRIL	LING M	COMPL ETHOD	S J	6/7/ 10//3 Daly	//"			
		PHIC LS /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:		s	1		SAME	LE D	ETAI	S			C A H N	1
FR O	A	Т	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLIMENTARY DESCRIPTIONS	S M P L	M M P E L T		SPLI (RE)	REC T SPO CORD 1	RATION ORD ON HI N-VAL VERIES	OWS URS		S I M T P E L R	P / 1 P I D	E A L L S L S L S	
48	T	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	8*	8"	6.	6*	N	R	Å	(ppm)	LS	
-[-		358	tan brown medium sanc, loose										09	_	-
8		368	ten brown to light gray fine-melium many		_	_									
\Box			tan brown to light gray time-melium sand	+	 	_							1.3		L
69		373	fan brown + light gray tim-medium sand	+	 				-				3.5		-
23		-	The standing of the standing o	1					_				3.7		-
4		317	light gray stilty clay, stiff										0.0		_
21		388	light gray fine sand toilt grange mostler												
			light gray fine sand toilt, orange mother	-	<u> </u>				_				11.6		
77				+				\dashv							-
88		398	light gray fine Sandts: It slight odin	†				\neg	ᅱ	-			8.6		
18		457							_				3.6		
*		70/	reddish brown meetium sand, losse, sweet odon	<u> </u>									11.7		
D		414	light gray silty clay, stiff	—						_					
[,	- 11 Cuy only Cuy only	1	\vdash			\dashv	\dashv				0.0		
4]		417	reclaish brown medium send, look				-		\dashv		\dashv		3.7		
				1		-				\dashv	\dashv		3./		
- 4	otes und Ments	ľ	DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: IOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LIDTES:		_		THICK	IESS _							

PHIC	SAMPLE DESCRIPTION				DRIL	LING N	(ETHO)	_ <u></u>	nie	0/10			
La	ORDER OF DESCRIPTIONS.	+-	1 6			SAM	LE]	DETAI	នេ			C A	G
Ţ	SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IN THE	S AMPL	A M M P E L T I H		SPLI (RE	REC T SPO CORD	ORD ON B N-VAI	LOVS		S I M T E R	P / I F	C S Y I A Y I	A I N S
	CALLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	#_	G D	6"	8*	6"	8-	N	R	Ä	1	LS	Ż
120	TRENTY TOTAL MEDIUM SAND, 10052	-	-	_							1.9		
433	reddigh brown medium soul longe	-	├			<u></u>	<u> </u>			_			
	Jan ,	+		\vdash					<u> </u>		1.2		
438	tan brown medium sand, love	\vdash			-			 -			00		_
Lira		1									0.2		
750							_				0.2		-
 	WI Joine Time sque ts. It									_			
	END AE ROOMY	<u> </u>											
	Cross Dr. Burching	 			_								
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į٧	ATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS			TOPSOIL	THICKN	ESS		<u> </u>					
	15 BGS 428 433 438 450 0 W	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOLIS) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS TO BEAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). 428 Cacicish brown Medium Sand, loose 438 Fan brown Medium Sand, loose 438 Fan brown Medium Sand, loose 438 Fan brown Medium Sand, loose 450 Fan brown Medium Sand, loose 450 Fan brown Medium Sand, loose 450 Fan brown Medium Sand, loose 451 GRAIN OF BOREHOLE CANNS DEPTH OF FIRST GROUNDWATER ENCOUNTER MATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S). (NATURE OF DEPOSIT). SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S). (NATURE OF DEPOSIT). GRAIN SUZZ/PLASTICITY. GRADATION/STRUCTURE, COLOUR. NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE EARLY IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). 428	DEPTH OF BOREHOLE CAWAG DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION DEPTH OF BOREHOLE CAWAG DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION DEPTH OF BOREHOLE CAWAG DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION DEPTH OF BOREHOLE CAWAG DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS	ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENTS). (NATURE OF DEPOSIT), GRAIN SIZE/PLASTICITY. GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS ROTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE E NO BAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). 428 Cacilish brown medium Sand, loose 438 Fan brown medium Sand, loose 438 Fan brown medium Sand, loose 438 Fan brown medium Sand, loose 450 Fan brown medium Sand, loose 450 Fan brown medium Sand, loose 450 Fan brown for reddish brown medium Sand END OF BORING DEPTH OF BOREHOLE CANNIS DEPTH OF FIRST GROUNDWATER ENCOUNTER TOPSOL WATER LEVEL IN OPEN BOREHOLE ON COMPLETION DETAILS:	ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), GRAIN STZE/PLASTICITY, GRADATON/STRUCTURE, COLORUR, WINDSTURE CONTENT, SUPPLEMENTARY DESCRIPTORS T NOTE: PLASTICITY DETREMENTARY DESCRIPTORS T NOTE: PLASTICITY DETREMENTARY DESCRIPTORS T NOTE: PLASTICITY DETREMENTARY DESCRIPTORS 4 G D 5° 6° 4133	DEPTH OF BORCHOLE CANNG DEPTH OF FIRST GROUNDWATER ENCOUNTER SAME DESCRIPTIONS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), GRAIN SIZE/FLASTICITY, ERLATIVE DESCRIPTORS TO NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS NOTE: PLASTICITY DEPTEMBENTARY DESCRIPTORS A M P E PLASTICITY DEPTEMBENTARY DESCRIPTORS RECORD	DEDER OF DESCRIPTORS: OBDER OF DESCRIPTORS: OBDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S) (NATURE OF DEPOSIT), GRAIN SIZE/FLABILITY, GRADATION STREET TOO BESTERY OF DEPOSIT), TO BAMPLE IS TOO DRY TO ROLL (DIDICATE IF MOISTURE WAS ADDED OR NOT). 428 FOR THE STREET OF DESCRIPTORS: A M M M PRECORD SPLIT SHOOM OF MOISTURE IF THE RECORD SPLIT SHOOM OF SPRIT SHOOM OF MOISTURE IF THE RECORD SPLIT SHOOM OF SPRIT SHOOM OF MOISTURE IF THE RECORD SPLIT SHOOM OF SPRIT SHOOM	ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(8) - PRIMARY COMPONENTS), NATURE OF DEPOSIT), GRAIN SIZE/FLASTICITY, CARDATON/STRUCKS, COLOUR MOTER COLOUR SUPPLEMENTAL DESCRIPTORS OR AMPLE DETAIL SUPPLEMENTAL DESCRIPTORS OR AMPLE IS TOO DRY TO ROLL (DIDICATE IF MOISTURE WAS ADDRED OR NOT). 4128 F. I. I. I. I. I. I. I. I. I. I. I. I. I.	ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPORENTS), (NATURE OF DEPOSIT), GRAIN SIZE PLASTICITY, GRADATION/SYMUTTIRE COLOURY VOISTURE CONTEXT, SUPPLEASINGTHER DESCRIPTORY ORALDE IS TOO DET, SUPPLEASINGTHER DESCRIPTORY ORALDE IS TOO DET, SUPPLEASINGTHER DESCRIPTORY ORALDE IS TOO DET OF TO ROLL (ROUGHEST THE ADDITION OF MOISTURE IF THE L. I. H. G. D. T. G. C. C. C. T. C. C. C. C. C. C. C. C. C. C. C. C. C.	DROBER OF DESCRIPTORS: SAMPLE DETAILS SAMPLE DETAILS SAMPLE DETAILS PENETRATION RECOMDAY STRUCKING, RELATIVE DENSITY/CONSISTENCY, CHARLES THE STRUCK OF PENETRATIVE DENSITY/CONSISTENCY, WOISTURE CONTENT. THE PREMATIVE DENSITY DESCRIPTORY **RECOMDAY STRUCK OF THE BECOMD SPILL PROCESSED TO THE BECOMD THE BEC	SAMPLE DETAILS SAMPLE DETAILS SAMPLE DETAILS SAMPLE DETAILS SAMPLE DETAILS SOIL TYPE STROUGS) SOIL TYPE STROUGH COMPONENTS (MATTRE OF DEPOSIT), SOIL TYPE STROUGH COMPONENTS ENLANT DESERTION GRAIN SIZE/FLASTICITY, GRADATION/STRUCTURE, COLOUR KONTER PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE LEVE IN OPEN BLOWN TO ROUGHT BY MOISTURE WAS ADDRES OR NOT). F. MOTE PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE LEVE IN OPEN BLOWN MEDICAL FLOWER WAS ADDRES OR NOT). F. MOTE PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE LEVE IN OPEN BLOWN MEDICAL FLOWER WAS ADDRES OR NOT). SAMPLE DETAILS FENTRATION S. M. M. M. M. M. M. M. M. M. M. M. M. M.	DECR OF DESCRIPTORS: SAMPLE DETAILS SAMPLE DETAILS DECR OF DESCRIPTORS: SOL TYPE STREAMED SHAPE DESCRIPTION SOL TYPE STREAMED SHAPE DESCRIPTION SOL TYPE STREAMED SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE STREAMED SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE DESCRIPTORS SOL TYPE SHAPE

INJECTION WELL I	NSTRUMENTATION LOG
PROJECT NAME: Hooker Ruco	HOLE DESIGNATION: TW-Z 0
PROJECT No: 6883	t = t
CLIENT: GSHT	DRILLING METHOD: Sonic
LOCATION: Hicksville, NY	
EGCATION. TITES THE TITES	Olovedi Elividori.
COMMISSION	GROUND SURFACE
CONNECTION AIR SUPPLY	HEADER/ AIR SUPPLY HEADER/POWER/CONTROL LINES
POWE	/
	BOREHOLE Ø: 6" in
	GROUT TYPE: Cement/bentonite
	AIR INJECTION WELL Ø: 1.25 in MATERIAL: 5/ec/
	WATER INJECTION WELL Ø: 1.25 In
	MATERIAL: 54 80 PVC
TOP OF SEAL AT: 357 ft	SEAL TYPE: bentonite
BOTTOM OF SEAL AT: 362 ft	
TOP OF SCREEN AT:	AIR INJECTION WELL Ø: 1.25 In MATERIAL: 5/201
BOTTOM OF SCREEN AT: 372 ft	SCREEN: Ø: 1.25 in SLOT SIZE: 16
BOTTOM OF SEAL AT: 385 ft	SEAL TYPE: bantonile
TOP OF SCREEN AT: 390 ft	
	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 1.25 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 400 ft	
TOP OF SEAL AT: 402 ft	SEAL TYPE: Sentonite
BOTTOM OF SEAL AT: 405 ft 1777 1777	
TOP OF SEAL AT: 420 ft_	GROUT TYPE: Cembert / Lentonite / pea stone
BOTTOM OF SEAL AT: 425 ft	SEAL TYPE: bentonite
TOP OF SCREEN AT: 430 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 435 ft	SCREEN: Ø: 1.25 in SLOT SIZE: 10
TOP OF SEAL AT: <u>440</u> ft	
480	seal Type: bentonite
BOTTOM OF SEAL AT: 450 ft	
SCREEN TYPE: AIR: X Continuous Slot	Perforated Louvre Other:
WATER: Continuous Slot	Perforated Louvre Other:
SCREEN MATERIAL: AIR: 🔀 Stainless Steel	Plastic Other:
WATER: Stainless Steel	X Plastic Other:
HOLE DIAMETER: 6" + 4501 , 7" + 290	
A. 1501	
DEVELOPMENT: METHOD: HIC (C)	DURATION:

St.	CLIE	MOETA	GSHT SURFACE ELEVATION HICKSU'IL NY WEATHER (ALL) (P.M.)				DATI DATI DRIL	DESIGNATION OF THE STREET OF T	START COMPI ETHOD	ED	Della 1	7-			
	REFERENCE	PHIC LS /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:					SAMI	LE I	ETAI	S			C A H N	G R
F R O	A	т	SOL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	S A M P L	S M M P E L I I I		SPL (RE	PENET REC IT SPO CORD : RECO	ORD ON BI N-VAL	LOWS JUES		B I A N T P E L R	P / 1 F 1 D	E A M L I Y C S A I	A I N S I
0	├-	<u> </u>		E	N O	6"	6"	6"	6"	N	R	Ā	(ppm)	LS	Ż
<u></u>	 	17	tan brown med- loasce sand t gravel							_			0.4		Ī
	 	-	some silt, loose												
7		37	1	i								_			
_	-	3/_	Tan brown med-coarse sand tyravel										0.0		
			trace 5:14, loose												
7		47	dole gray/black Silty Clay Stiff	L											
			dock gray/black silty clay, stiff										0.0		
2		54	tan brown fine sand, loose of gray mother												Ĺ.
			Tive sex / wast of gray matter			L						_	0.0		<u></u>
	54		we for table			-				<u> </u>					<u></u>
				-		<u> </u>	Щ.Н			_					-
4		57	light gray fine sund wil tay brown marbled grags	_		-	_	-							<u> — </u>
			The state of the s										0.0		<u>—</u>
<u>1</u>		70	tan brown medium sand, loose, trace silt				$\neg \neg$						ر،0		
{		65								-	_		ر ، بر		
_		77	light gray paction sund, look, trace sit	\vdash				\vdash			—		0.0		
ᆉ		00													_
<u></u> L		82	tan brown medium sand, loose										0.0		
	OTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER	-		TOPSOIL	ТНІСКІ	NESS						1	
COI	and Chents	ļ	note: for each split—spoon sample, record blow counts, n—value, sample recovery le notes:	IGTH, A	ND SAMP	LE INTE	RVAL								_

	LOCA	TION	B Hooker Ruid BRILLING CONTRACTOR BOARD LEA BRILLER G. SEGLEY SURPACE ELEVATION WEATHER (AM) (P.M.)	77-			DATE DATE	DESIGNATIONS TONE LING MOSUPER	START COMPL ETHOD	ETED _	ron i e	4110			
DEPTHS	TIGRAI TERVAI IN M	PHIC LS /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S). (NATURE OF DEPOSIT). SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/FLASTICITY, GRADATION/SIRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	8	N N S		1	SAMP PENETI RECO	CATION ORD	i	LS	S I A N M T	P /	C AN A LY S I	G B A I N
F R Q M	A T	T	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	A M P L E	PE LT IH NO		(RE	CORD 1 RECO	N-VAL VERIE:	UES S)		A N M T P E L R	D F	E A M L C S L S	9 1
82	<u> </u>	90	had a bot		GD	6"	8"	6"	6"	N	R	L A	(ppm)		É
			light brown Sandy layers				_						0.0		
30		97	light gray fine sand + silt				_			_			0.0		-
77		II T	light oran fine sund loace true all										0.0		
			light gray fine sand, loose trace of it												
17		13/1	light gase fin sent, tage sit	-	-					ļ			0.0		F
2.4		124								_					
24		135	light gray sity clay, stiff			_							0.0		
35		137	light gray - Fine sand, loose						_				0.2		
37		157	light gray fine-mad Sand, come sill, loose	_		_							0.0		
57		2													
24.		ורו	Clay layer at lib -173	-		0.0									_
\Box			Man VI ton-(1)					\vdash		-			 		 -
	OTES IND		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSOIL	L THICK	NESS _					1		_ _

	PRO CLU	JECT NUM	STRATIGRAPHY LOG (OVE DRILLING CONTRICTOR BOAT LO DRILLING CONTRICTOR BOAT LO DRILLER GETATION SURFACE REVATION (P.M.)			√)	DATE DATE DRIL	DESIGNATION OF THE SUPERIOR OF	START COMPI	ED	I 10/19 5001	1/10 c	3_ or	<u>6</u>	
n	ATIGRA VIERVA	T C	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:					SAMP	LE I	DETAL	នេ	·		C A H N	G R
F R O	S IN ft	/m BGS	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	A M M P E L T I H		SPLI (RE	PENETE RECO T SPON CORD N RECO	ORD ON BI (-YAI	LOWS		S I A N P E L R	P / 1 P I D	TENT CATE	I N S
177	T	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	£	N O	6"	8"	8"	8"	N	R	L	(ppm)		Z
		197	light gray fine sand Some sitt , firm			ļ	_			<u> </u>			0,0		
17		204	light gray to tan brown fire soul will from										0.0		
24		210	tan brown silty clay, stiff										0.0		
210		225	dak gray / black 5: Ity clay, very stiff										Oco		
25		231	tan brown fin sandtsilt, firm										6.0		
3.7		250	orange brien fine-medium sand +sit locce										0.2		
50		251	dark gray / black Silty clay, very stiff										00		
57		268	Orange-brawn medium sund losse			_							0.2		
८४		278	light gray fine sand to ilt, firm									-	0.1		_
78		285	ten brown fine medium Sendiledse, Sweet oder DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER_				L THICK						1.7		
	iotes and Micht	8	WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LEI NOTES:									<u> </u>			



	PROD	ect num Nt	STRATIGRAPHY LOG (OVE BER 6883 COS HT CLUCSVILLE, NY STRATIGRAPHY LOG (OVE DEILING CONTRACTOR BOOK Lov DEILING CONTRACTOR BOOK Lov DEILING CONTRACTOR BOOK Lov DEILING CONTRACTOR BOOK Lov SUPPLIES (AM.) (P.M.)			i)	DATE DATE DRIL	DESIG TIME TIME LING MI SUPER	BTARTI COMPL ETHOD	ED	Tiefic	PAGE W -21	4 or	<u>6</u>	
DEPTHS	ATIGRAF (TERVAL I IN ft,		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SUIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT). SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR.	8 A W	8 A W W P E		SPL	SAMP PENETI REC	RATION ORD ON BI	T EWO.	LS	S I A N M T	P /	C A H N E A L I Y C	G R A I
F O M	A T	T	MOISTURE CONTENT, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDRE) OR NOT).	PLE	LT IH NO GD	6"	(RE &	RECO	N-VAL VERIE 6°	N N	R	M T E R L	D F D (ppm)	C S A I L S	S I Z E
285		188	light gray silty clay, stiff										0.0		
288		292	dark gray/ blade 8: Hy Clay, Vory Stiff								_		0.0		
292		297	light gray + orange brown fin sand + silt, sweet dor		_								1.2		
2918		308	tan brewn Medium sand, luosa, odor										1.6		
308		318	tanbrown medium sant, loose, oder										1.3		
318		328	reddish brown and light grow fine sand + silt, odor										6.5		
328		347	reddish brown fine-medium sand trilt, loose odor										3.1		
347		357	tan brown medium sand, some fine sand +5.11, odor										7.9		
357		360	tan brown Medium sand, some fine sand toill, odor										4.1		
360		368	DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER_			TOPSOL	TUIC	NESS					2.8		
	NOTES AND MOJENT	3	WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LE												



er (te)	LOCA		SURFACE BLEVATION 4. i & 5 v : (e, N) y WEATHER (A.M.) (P.M.) SAMPLE DESCRIPTION				DATE DRILL CRA	TIME TIME LING ME SUPERIOR SAMP	COMPLETHOD VIBOR	ETKI)	Son c				
IN	TERVA IN A		CRDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTUR, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	S A M M P E L T I H		SPLI (RE)	PENETI RECO T SPO CORD 1 RECO	RATION ORD ON HI N-VAL	ovs Ues	LEO	S I M T P E L R	P / D F I D	CHMMIC 41	G R I N S I
¥ 364	T	378	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	F	N O G D	6*	6"	8*	6"	N	R	A L	(ppm)		Z
•		3/8	light gran fine sand +5:14, odor							<u> </u>			6.8		<u> </u>
78		387	light gray flore sand + silt in redlish brown										9.2		
387		397	reddish brown fine-medium sand, some sitt										6.8		
97		408	readish brown medium sand, loose									3.1			
108		414	reddish brown mediumsand, loose										4.8		
ग्म		418	reddish brown medium sand wil light gray elay lenses										4.3		
18		422	reddish brown medium seed, loose										3.3		
122		428	raellish brown + light gray fine sand + silt, firm				1.3						-	_	
<u> </u>	NOTES AND		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWAYER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:			TOPSOL	L THICK	NESS _			<u> </u>				

	PROJ	ECT NAME ECT NUM ECT NUM ET	DRILLER GROWN Scales DRILLER GROWN DRILLER GROWN SURFACE KLEVATION (P.M.) (P.M.)				DATE DATE DRILL CHA	DESIG /TIME: /TIME: ING MI SUPER	STARTI COMPLI CTHOD 7150R	ETRO _	10/1 (a) 501		<u>6</u> or		
IN		S	SAMPLE DESCRIPTION OEDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS MOTE-PLASTICITY DETERMINATION PROMISES THE ADDITION OF MOISTURE TO THE	日本の関係では	S M M P E L T I H		SPLI (REC	SAMP PENETI RECO T SPO CORD 1 RECO	RATION ORD ON BL	OVE UES	S	S I A N M T P E L R	P / D F I D	CHEMICAL SISI	G R A I N
й 28	Ť	6 438	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT). FEELISH Brown & Light gray Pinesand + Silt Africa.	E #	N O G D	6"	6"	6*	6"	М	R	Î.	(ppm)		Z E
438		450	reddish brown mediumsand, some fine sand +514										0.2		
	450		END OF BORING												
											-				 -
													 		
	NOTES AND DEMENT	8	DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE NOTES:			TOPSOIL								<u>L_</u>	

INJECTIO	N WELL INSTRUME	ENTATION LOG
PROJECT NAME: Hooker Ruca	HOLE DE	SIGNATION: TWZI
PROJECT No: 6883	DATE CO	MPLETED: /0/23//6
CLIENT: GSHI		METHOD: J'oar'c
LOCATION: Hicksville, NY		PERVISOR: S. Daly
LOCATION. THE COUNTRY TO Y	CINA BUF	ERVISOR.
	CONTROL LINES	GROUND SURFACE R SUPPLY HEADER/POWER/CONTROL LINES BOREHOLE Ø:
TOP OF SEAL AT: <u>365</u> ft_ BOTTOM OF SEAL AT: <u>375</u> ft_	- 13:1 17:1 17:1 13:1	MATERIAL: <u>steel</u> NATER INJECTION WELL Ø: <u>1.25</u> in MATERIAL: <u>sch 80 pvc</u> SEAL TYPE: <u>Bentanite</u> chips NIR INJECTION WELL Ø: <u>1.25</u> in MATERIAL: <u>steel</u>
TOP OF SCREEN AT: 375 ft		AIR INJECTION WELL Ø: 1,2 \$ In
BOTTOM OF SCREEN AT: 380 ft_		
TOP OF SEAL AT: 385 ft_		SCREEN: Ø: 125 In SLOT SIZE: 16
BOTTOM OF SEAL AT: 375 ft		SEAL TYPE: Benton la Chips
TOP OF SCREEN AT: 400 ft	(\$4.16.76.97.17.27 Telephone 19.99)	PACK TYPE: SAND, SIZE # 0 GCREEN: Ø: 1.25 In SLOT SIZE: 10
BOTTOM OF SEAL AT: 415 ft	T	BEALTYPE: Bestonik Chips
TOP OF SEAL AT: 425 ft BOTTOM OF SCREEN AT: 435 ft BOTTOM OF SCREEN AT: 440 ft TOP OF SEAL AT: 445 ft	- S	BROUT TYPE: Cement/benton. te/peq gravel BEAL TYPE: Benton, le Chips PACK TYPE: SAND, SIZE #0 BCREEN: Ø: 125 In SLOT SIZE: 10
BOTTOM OF SEAL AT: 450 ft_	- S	EALTYPE: BOATONIK Chips
SCREEN TYPE: AIR: X Continu WATER: X Continu	us Slot Perforated	Louvre Other:
	nless Steel Plastic	Other:
HOLE DIAMETER: 6" to 450		Z I D ,
DEVELOPMENT: METHOD: Aich		DURATION: 1,5, 1,25, 1 h- (250 9415) each

		STRATIGRAPHY LOG (OVE	RBU	RDEN	ſ)						PAGE	or	6	
PROJ PROJ CLIEN	ect name ect num nt <u>S</u> 5	BER 6837 DRILLING CONTRACTOR BOAT L DRILLING CONTRACTOR BOAT L DRILLING CONTRACTOR BOAT L DRILLING CONTRACTOR BOAT L SURFACE ELEVATION				DATE	/TIME	STARTI COMPL	ETED _	10/2	4/10			
LOCA	TION	· · · · · · · · · · · · · · · · · · ·				DRILL	LING M	ETHOD		ion i	<u> </u>			
											γ			
ATIGRAF	PHIC						SAMP	LE D	ETAL	S			H N	G R
S IN ft,	m BGS	SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	M M P E L T		SPLI (RE	REC T SPO CORD	ORD ON BI N-VAL	OWS		A N M T P E L R	P / I F I I	E A I Y C S A I	A I N S I
A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6"	6"	6"	N	R	L		L \$	Ż
	37	tan brown fine - medium sand and										0.0		
		gravel, some silt. 1005e										ļ		
	54	dark gray / black sitty clay, very stiff										0,0		
	57	Feddish brown medium sand loose										0.0		
	77	tan known and light gray medium sand										O. c)		
	OH.													
	87	right gray Medium Sand, 18052	 				-	<u> </u>			<u> </u>	0.0		
	87	light gray silty clay, stiff										0.0		
	94	light gray city clay, stiff										0.0		
	97	light gray fine-medium sand, some sitt, loose					ļ				ļ	0.0		
	100	light gray fine-medium rand, lose		-				-		\vdash		0.0		
notes and omment	13	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:												
	ATIGRAI NTERVAI S IN ft, A T	ATIGRAPHIC STERVALS S IN ft/m BGS A T O O O O O O O O O O O O O O O O O O	PROJECT NAME Hocks Ruce PROJECT NUMBER 6837 CLIENT 51HZ LOCATION Hicksville, NY ATTIGRAPHIC STERVALS SIN fl/m BGS SIN	PROJECT NAME Hole Role Role PROJECT NUMBER 6837 LOCATION Hicksville, NY SERFACE REPRATION WEATHER (A.M.) (P.M.) ATTIGRAPHIC STERVALS SIN fl/m BGS SIN fl/m B	PROJECT NAME Hocks Ruce PROJECT NAME Hocks Ruce DRILLER GRANT Seely SUBSTANT LOCATION Hicksville, NY ATTGRAPPITC STIFF SUBSTANT SUBSTANT SEELY TREATMS SOLD TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), A TO SCHOWLER COMPONENTS, RELATIVE DESCRIPTION A TO NOTE: PLASTICITY DETREMNATION REQUIRES THE ADDITION OF MOISTURE IF THE E NO SAMPLE IS TOO DRY OR ROLL (RIDICATE IF MOISTURE WAS ADDED OR NOT). 37 tan brown fine - medium Sand and locat Gravel, Seme silt foose 37 tan brown fine - medium Sand locat 37 tan brown fine - medium Sand locat 4 sec. 34 light gray medium sand locat 16 sec. 37 light gray medium sand, locat 18 light gray medium sand, locat 18 light gray silty clay, stiff 4 gray light gray fine medium sand, seme sith, loose 18 light gray fine mediu	CLIERT 13.74. LOCATION Hicksville, NY TRATER (ALL) (P.M.) ATTIGRAPHIC STREVALS SIN FL/M BGS SOIL TYPE STABOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/FLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTION A T NOTE: PLASTICITY OF ROLL (INDICATE IF MOISTURE BY THE LE IN NO SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). 37 tan brown fine - medium Sand and 9 ravel, Seme Silt, losse 54 dark gray black sitty clay, very stiff 57 teddish brown medium sand losse 187 light gray medium sand losse 187 light gray medium sand, losse 187 light gray silty clay, stiff 197 light gray filty clay, stiff 197 light gray fine medium sand, seme sitt, losse 187 light gray fine medium sand, seme sitt, losse 180 light gray fine medium sand, losse 180 light gray fine medium sand, seme sitt, losse 180 light gray fine medium sand, losse 180 light	PROJECT NAME Hock Ruce PROJECT NUMBER 5877 DRILLER STATA LOCATION Hicksville, NY SAMPLE DESCRIPTION ATTGRAPPIC ORDER OF DESCRIPTORS: S IN ft/m BGS SI	PROJECT NAME Hole Rice PROJECT NAME Hole Rice PROJECT NAME Hole Rice PROJECT NAME Hole Rich PROJECT NAME Hole Rich PROJECT NAME Hole Rich PROJECT NAME Hole Rich PROJECT NAME Hole Rich Rich Rich Rich Rich Rich Rich Rich	PROJECT NAME Holds Ruce PROJECT MANSER 6837 DRILLEN CONTRACTOR	PROJECT NAME PR	PROJECT NAME Hocks Ruce PREDICT NAME Hocks Ruce PREDICT NAMERS 6977 DRILLER 7674 Jeply DRILLER 9674 Je	DRILLING CONTRACTOR BROOK Long 1827 DRILLING CONTRACTOR BROOK Long 1827 DRILLING CONTRACTOR BROOK Long 1827 DRILLING CONTRACTOR BROOK Long 1827 DRILLING CONTRACTOR BROOK Long 1827 DRILLING CLIENT STANTOD DATE; THE DESCRIPTION THAT BROOK PROTECTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION A M M STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. ORDIN STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. A TO STEEPHASTICHT, GRADATION PROTECTIONS COLOUR. B TO GRADATION PROTECTION HAVE BEEN BEEN BEEN BEEN BEEN BEEN BEEN BE	PROJECT NAME Holds Ruce PROJECT NAME Holds Ruce DELLER STATE DETLER STATE DETLER STATE DETLER STATE DETLER STATE DETLER STATE DETLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DELLER STATE DETLER S	PRODUCT NUMBER & \$27 DRILLING CONTRACTION DRILLING SCAND Longly DRILLING Control Drilling Scand Longly Drilling Scand Longly Drilling Scand Longly Drilling Scand Drilling Scand Longly Drilling Scand Longly Drilling Scand Longly Drilling Scand Longly Drilling Scand Longly Drilling Scand Longly Drilling Scand Drilling Drilling Scand Drilling



	PROJ	ect num	BE HOOKE RUCE DRILLING CONTRACTOR BOAT LA BER C883 DRILLER GEORGE SURFACE ELEVATION WEATHER (A.M.)	angy	<u> </u>		DATE DATE	DESIG TIME TIME ING M	STARTE COMPLI	ELKD _	10/24	U-27 U/O E//O			
			(P.W.)					SUPER			Daily	,			
	ATIGRAI TERVAI		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:					SAMP	LE D	ETAI	LS			C A H N	G R
(DEPTHE F R O	IN ft,	/m BGS	SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	S M M P E L T I H		SPLI (REC	PENETI RECO T SPO CORD I RECO	ORD ON BL N-VAL	OWS		S A N T E R V	P/ IF DF	E A I	A I N S
Ж	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6"	6"	6*	N	R	Ā	(ppm)	LS	I Z E
199		107	light gray fine sand + silt, clay lenses, firm									~	0.0		
107		(14	light gray silty clay willayers of fine sand firm										0.0		
114		1/7	light gray fine - medium sand, loose										0.0		
117		127	light gray fine-medium Sand, some silt, losse										0.0		
127		134	light gray fine sand +silt, some clay, firm										0.0		
134		137	light gray silty clay, stiff										0 ، وا		
137		147	light gray medium sand, loose										0.0		
147		152	light gray medium sand, 10050										0.0		
152		157	dark gray/black silty clay, stiff										0.0		
157		167	tan brown and light gray fine sand trill clan lagers										0.0		
1	NOTES AND	•	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LE	2071	AND CALL		L THICK	NESS _							
	JAMENI		NOTES:	246 IM,	ANU SAM	FLE INI	ERVAL								

STRATIGRAPHY LOG (OVERBURDEN)

page 2 of 6



	PROJ PROJ CLIEN LOCA	ect name ect nume or Cris	STRATIGRAPHY LOG (OVE. BER 6883 OFF SURFACE ELEVATION WEATHER (A.M.) (P.M.)	7 7 97		r)	DATE DATE DRILL	/TIME /TIME LING M	STARTE	TOV DED_	191 192	-22 24110 6110	3 or	<u>6</u>	
	ATIGRAF TERVAI IN ft,	S /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE	S M P L E	S M M P E L T I H N O		SPLI (REC	PENETI REC T SPO CORD I RECO	ON BL N-VAL VERIES	ows UES 5)	-	S I A N M T P E L R E V	P/IFI	C A H N A M L Y C A I L S	G R A I N S I
167	<u>T</u>	177	SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). tan brown + light gray fine-medium Jand + Sill	#	G D	6"	6"	6"	6*	N	R	Ĺ	(ppm) 0.2		Ē
177		180	SAME										0.3		
180		/97	light gray torange brown Fine sand +5; It some										0.1		
197		207	tan brown fine-medium sand +5:1+ firm trace clay										0.0		
207	-	212	fan brown fine-medium sand+sitt, firm										0,0		
212		217	dork gray / black silty clay, stiff										0.0		
217		227	reddish brown fine sand some silt firm			<u> </u>							0.0		
227		231	dark gray silty clay, stiff	<u> </u>		-	 	ļ		-			0.0		
231 c	NOTES AND OMMENT		TEAN BROWN FIRE MEDIUM SAINT WISTH, FIRM DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINOTES:										0.0		



	CLIEN	NT 453	cksy: le, NY WRATHER (A.M.) (P.M.)			1)	DATE DATE DRILL CRA	/TIME /TIME LING MI SUPER	NATION STARTE COMPLE ETHOD _ VISOR _	160 1 160 1 160 1	Daly	-22 110 110	<u>4</u> or	<u>6</u> 	
II (DEPTH:	ATIGRAF NTERVAL S IN ft,		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M	S A M M P E		I SPLI	PENETI RECO	LE DI RATION ORD ON BLA N-VALU	ows	S	S I A N M T P E L R E V	P /	C A H N E A M L C S	G R A I N
F R O M	A T	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P L E #	LT IH NO GD	6"			VERIES		R	L R E V A L	D F D D (ppm)	A I L S	S I Z E
237		257	crange brown medium Sand, loose, some silt										0.0		
257		204											0.0		
264		277	tan brown + light gray fine sand + silt wl some slay, firm, slight odo-										0.3		
277		287											0,8		
287		297	tan brown medium sand, losse, sweet odor										3,1		
297		308	fan brown medium Sand, loose, Sweet odor										1.3		
308		318	SAME	_									6.8		
318		3 25	SAME										2,4		
I	NOTES AND OMMENT	rs	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINOTES:					NESS _					1		



			STRATIGRAPHY LOG (OVE			N)						PAGE	<u>.5</u> or	6	
	PRO	DECT NAM	BER 6883 DRILLING CONTRACTOR BOAT LO	-57e	*1,				NATION			W-22			
	CILIK	NT C	SUFFACE REPUTION								c/24,				
	LOCA	ATION	Hicksville, NY WRATHER (AM)									5/10			
			(P.M.)						VISOR					—	
STIP	ATIGRAI	PHIC	SAMPLE DESCRIPTION					_	LE D			===			
R	TERVAL	LS	ORDER OF DESCRIPTORS:	\vdash	8	Т					<u>~</u>	r 		C A H N	G R
F		/m BGS	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	M M P E L T I H		SPL (RE	REC T SPC CORD	RATION ORD ON BL N-VAL VERIES	OWS		S I A N M T P E L R	P / I F I I	E A M L I Y C S	A I N S
R O M	A T	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	8"	6"	6"	6*	N	R	E V A L	D (ppm)	A I L S	I Z E
325		327	dark gray silty clay, stiff										0.0		
200		 		1		1									
327		344	light gray fine sound + silt, firm, odo	<u> </u>									2.1		
2711		0:/0											'	1 1	
344		348	tan brown madium Sand, 10052. oder	ــــ	-	 	<u> </u>						1.2		
348		100			—	ــــــ									L
348		361	reddish brown medium sand, loase, odar	┼	 	 	ļ						0.8		
36i		365	dark gray silty clay stiff	 	+	 	-						0.0	 	ļ
			737, 37, 144	 	+-	┼──	 			_	 -		0.0		<u> </u>
365		378	light gray fine sand +5: It firm, 5 light och	\vdash	 	┼						<u> </u>	4.8	\vdash	<u> </u>
				t		 		_			 		7.8	\vdash	<u> </u>
378		388	fan brown medium sand, loose; odor	 							-		7. 8		
					T								- 6		
383		398	light gray medium sand, loose, oder			1							1.4		
													7		
398	-	408	reddish brown medium sand losse, ado-										1.0		
1/20		100	,												
408		418		1									2.2		
l			DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER			TOPSO	L THICK	NESS _							
			WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS												
	NOTES		COMPLETION DETAILS:												
Ct	AND MMENT	3	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE NOTES:	ngth,	AND SAM	IPLE INT	TERVAL.				<i>-</i>				
			<u> </u>												



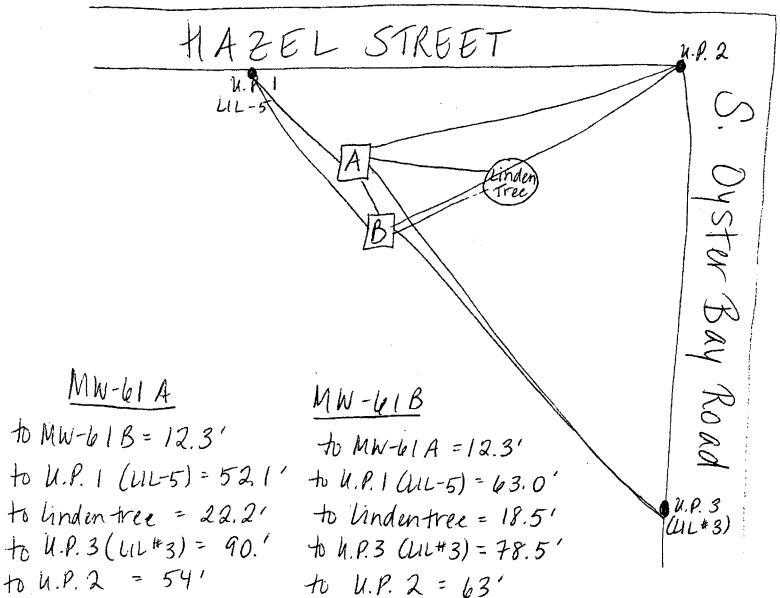
			STRATIGRAPHY LOG (OVE	RBU	RDE	V)						PAGE	or	<u>6</u>	
	PROJ PROJ CLIEN LOCA	ECT NAMECT NUMBER	BER 6893 DRILLING CONTRACTOR BEACH LOS DRILLER GEORGE STORY SUFFACE BLEVATION WEATHER (A.M.)				DATE	TIME	START COMPI	ETED	1012	6/10			
			(P.M.)				CRA	Ling M Super	ethod Visor	<u>.رر</u>	Dall				
STR	ATIGRAF	PHIC	SAMPLE DESCRIPTION	<u> </u>				SAME						C A	G
(DEPTHS	TERVAL	S	ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	S A M M P E		SPL	PENET REC	RATION ORD ON BI	X X		S I A N M T P E L R E V	P /	HE MITSIS	R A I N
F R]	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	P	PELT	İ	an)	CORD :	VERIE	2) \$)		ĹŘ	D F I D	CS	S
0 M	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6"	6"	6"	N	R	A L	(ppm)	LS	Z E
418		425	Fedelish brown medium Sand, loase, odor										3.4		
425		428	light gray fine rand + silt trace cky, firm	├	<u> </u>	-	 	 		ļ			1,2		
2/50													// 		
428		440	light gray fine sand + silt, clay lenses, firm reddish brown medium sand, some time sand	╂	ļ		ļ	<u> </u>				 	0.2		
440		450	reddish brown medium sand, some time sand			 				-	<u> </u>		0.5		
!		ļ	and silt, loose												
	450		END OF BORING	\vdash	-	 	 	-		├-	-				
		<u> </u>													
				\vdash	+	-		-		 	┼	 			
ļ															
				╀	+	-		-		-	-	ļ		<u> </u>	
						-					<u> </u>	ļ			
		 													
	<u> </u>	1	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _	<u></u>	<u> </u>	TOPSO	IL THIC	KNESS .	<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>	
	Monte		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:												
	NOTES AND MOMENT	3	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY L' NOTES:	ength,	AND SAM	APLE IN	TERVAL	•							



INJECTION WELL I	INSTRUMENTATION LOG
PROJECT NAME: Hooker Russ	HOLE DESIGNATION: TW-2Z
PROJECT No: 6883	DATE COMPLETED: 11/3/10
CLIENT: GSHT	DRILLING METHOD: Son's
LOCATION: Hicksville, NY	CRA SUPERVISOR: S. Daly
CONNECTION	GROUND SURFACE
AIR SUPPLY POWE CONTROL	R/ AIR SUPPLY HEADER/POWER/CONTROL LINES
	BOREHOLE Ø: 6 in
	GROUT TYPE: Portland Coment/brokente
	AIR INJECTION WELL Ø: 1.25 In MATERIAL: 5/e/
	WATER INJECTION WELL Ø: 125 In MATERIAL: PVC
TOP OF SEAL AT: 345 ft	√ 18 · · · · · · · · · · · · · · · · · ·
BOTTOM OF SEAL AT: 350 ft 1	SEAL TYPE: Bentuite Chips
TOP OF SCREEN AT: 355 tt ft	AIR INJECTION WELL Ø: 1.25 In MATERIAL: 5/ee/
BOTTOM OF SCREEN AT: 360ft	[23] [23]
TOP OF SEAL AT: 365 ft ft	SCREEN: Ø: 1.25 in SLOT SIZE: 16
BOTTOM OF SEAL AT: 350 ft ft	SEAL TYPE: Bentante Chip
TOP OF SCREEN AT: 385 ft ft	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: /.25 in SLOT SIZE: //
BOTTOM OF SCREEN AT: 39/5 ft	
TOP OF SEAL AT: 396 ft BOTTOM OF SEAL AT: 386 400 ft	SEAL TYPE: Benting Chip
	GROUT TYPE: Portland Cement/bintonile/pra grave
TOP OF SEAL AT: 411 ft	17 L L 1 M L
BOTTOM OF SEAL AT: 415 ft	SEAL TYPE: Beatonite Chip
TOP OF SCREEN AT: 420 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 425 ft	SCREEN: Ø: 1,25 In SLOT SIZE: 10
TOP OF SEAL AT: 430 ft ft	
BOTTOM OF SEAL AT: 450 ft	- SEAL TYPE: Bentonite Chip
SCREEN TYPE: AIR: X Continuous Slot	Perforated Louvre Other:
WATER: 💟 Continuous Slot 🗌	Perforated Louvre Other:
SCREEN MATERIAL: AIR:	Plastic Other:
WATER: Stainless Steel	✓ Plastic
HOLE DIAMETER: 6" to 450 7" to 2	
1. 1.	
DEVELOPMENT: METHOD: Hicket	DURATION: 3,1, hr (250 gg/s/each)

M

MW-1 CUSTER





Page 1 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITOR INSTALLATION	ox.	3	SAM.	T	
	GROUND SURFACE TOP OF RISER	121.19 120,91		NUMBER	NTERVAL	REC (%)	'N' VALUE	
	SOIL, brown, some vegetation			<u> </u>		 	=	-
:					L			
_5	CANDIcall sade beautiful	116.69		1	\geq			
·	SAND/soil, rock, brown/orange				\mathbb{N}] .	
				2	IX			
-10	•				$\langle - \rangle$			
				3	\mathbb{V}			
				"	$ \wedge $			
-15	·				$\langle \cdot \rangle$			
				4	X			
-20			27 0 BLACK		$/\setminus$			
-20			2" @ BLACK STEEL RISER		\setminus			
1			RISER	5	X			-
-25	- some clay inclusions, tan/black at 25.0ft BGS	or 40			$\langle - \rangle$			
	CLAY, stiff, moist	95,19		6	\bigvee			
	- very stiff clay at 29.0ft BGS			١	Λ			
-30	•]				
L		87.99		7	XI			
-35	SAND, tan/black	01.00			\triangle			
				ſ	\./			
i				8	ΧI			
-40			CEMENT/ 6% BENTONITE	k	$\langle - \rangle$		- 1	
			GROUT	9	\bigvee	1		
	- N// - I				$/\backslash$	1		
45	- stiff clay at 45.0ft BGS	- 1		1	abla	- [
		1		10	XI		ı	(
-50				k	\triangle			
	- black, gray clay inclusions, moist at 52.0ft BGS	l		[$\setminus / $		- 1	
	- no clay at 54.0ft BGS]		11	ΔΙ		1	C
55	SANDY CLAY, tan/orange, wet	66.19		K	$\left(\cdot \right)$			
	- sand, wet at 56.0ft BGS			12	XI			C
60		61.19			\triangle			
	CLAY, dark gray, moist	01.13			$\overline{}$	- 1		
		1		13	XL		- 1	0
65		- 1		K				
					\bigvee	- 1		0
	SAND, stiff, gray/tan, clay inclusions, light gray	53.19		16	$\triangle \Gamma$			U
70				K				
		ſ		15	X L			0
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE; REFI	R TO CU	RRENT ELEVATION TABLE					



Page 2 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION			SAM		
550		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	وال (سوس)
	- gray/orange layering, moist at 75.0ft BGS			16	X			C
-80	- tan/orange, moist at 80.0ft BGS		CEMENT/ 6% BENTONITE GROUT	17	\bigcirc	-		(
-85	- wet at 85.0ft BGS				\bigcirc			
-90				18	\bigcirc			
-95		·		19	$\langle \rangle$			(
-100	· •			20	\boxtimes			(
- 105				21	X			C
				22	X			C
-110	- light gray clay inclusions at 114.0ft BGS			23	X			C
-115	- light gray clay inclusions at 115.5ft BGS			24				0
-120	- some gray clay at 120.5ft BGS		2" Ø BLACK STEEL RISER	25	\forall			o
-125					$\langle \rangle$			
-130	- Groundwater sample collected at 130.0ft BGS			26	$\langle \rangle$			
135	CLAY, red/brown, moist	-13.31		27	Δ			O
140	- dark gray clay, very stiff, dry at 136.0ft BGS			28	X			0
				29	X			0
145	- wet at 145.0ft BGS			30	X			0
NO.	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO CU	IRRENT ELEVATION TABLE					



Page 3 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION	~	T	SAM	· -	
		AMSL	·	NUMBER	INTERVAL	REC (%)	'N' VALUE	(man) (Jid
-	- dry to moist at 151.0ft BGS			31	\bigvee			0
155	•		CEMENT/ 6%		\triangle			
			BENTONITE GROUT	32	X			O
160	SAND, brown/orange, saturated - light gray clay inclusions at 161.5ft BGS	-38.81		٠	$\langle \cdot \rangle$			
- 165	- iigiit gray day iiidasidis at 101.5it bee		BENTONITE	33	\bigwedge			0
: 100				34	\bigvee			0
170			SAND PACK		$\langle \cdot \rangle$			
	- stiff clay at 173.0ft BGS			35	X			0
-175	- stiff clay inclusions at 177.0ft BGS		WELL SCREEN	36				0
-180	SAND, with clay inclusions, gray/tan	-58.81		~	\triangle			J
	- no clay at 183.5ft BGS			37	X			0
185	- Groundwater sample collected at 185.0ft BGS			Ì	(\cdot)			
-190			2* A Pl ACK	38	X			0
190	- dark gray/black with some clay inclusions at 191.0ft BGS	-70.31	2" @ BLACK STEEL RISER	39	\bigvee			0
-195	CLAY, stiff, light gray/bright orange SAND, some clay, light gray/tan orange	-73.81	BENTONITE	k	$\langle \rangle $			
			CHIPS	40	XI			O
-200	CLAY, stiff, gray, with tan/orange sand SAND, orange/brown, wet	-78.81 -79.81		K	$\langle \cdot \rangle$			
-205	SAND, diangeriowii, wet		SAND PACK	41	\triangle			0
200				42	\bigvee			. 0
-210	- clay inclusions at 210.0ft BGS		WELL SCREEN	K	(\cdot)			
				43	XI			0
-215	- tan/orange at 215.0ft BGS			.				0
220	- stiff sandy clay, tan/orange at 219.0ft BGS - stiff clay inclusions at 220.0ft BGS		un un	*	\triangle			U
	- oun way suvuoivsio at 220.011 DOO			45	X			0
NC NC	<u> </u> <u>TES:</u> MEASURING POINT ELEVATIONS MAY CHANGE; RE	FER TO CU	IRRENT ELEVATION TABLE					



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PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITOR INSTALLATION	94		SAMF		T
			,	NUMBER	INTERVAL	REC (%)	'N' VALUE	
	CLAY, stiff, tan/orange sand, wet	-103.81		45	V			
230				47	\bigcirc			
235	SAND, brown/tan, reddish, wet	-113.81		•	\bigcirc			
240	- clay, stiff at 236.0ft BGS	-118.81		48	X			
240	CLAY, stiff, dark gray - wet at 243.0ft BGS	-110.01	BENTONITE CHIPS	49	X			
245				50	\bigcirc			
250	SAND, tan/orange, wet	-128.81	2" Ø BLACK STEEL RISER		$\langle \cdot \rangle$			
255	- Groundwater sample collected at 255.0ft BGS		RISER	61	\triangle			
200				52 ·	X			
260				53	X			İ
265	· ·			54	\bigvee			:
270		-150,81	SAND PACK		$\langle \cdot \rangle$			
275	SANDY CLAY, gray/orange, stiff	-130.01	WELL SCREEN	55	\triangle			
280	SAND, light gray clay inclusions, some red	-156.81		58	X			
:00				57	X			
85	CLAY, very stiff, gray	-163.81		58				
90					$\stackrel{\frown}{}$			
95								
NO.	TES; MEASURING POINT ELEVATIONS MAY CHANGE; I							



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PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION			\$AMI		
fl BGS		AMSL		NUMBER	NTERVAL	REC (%)	'N' VALUE	PID (ppm)
		<u>. </u>	Samuros.	3	Ξ	122	눛	H
-305		-183,81						
- 303	SANDY CLAY, pink/red gray, moist. Groundwater sample collected at 305.0ft BGS	100.01			\setminus			
				59	$ \Lambda $			0
-310								
:				60	IX			0
-315	SAND, gray/tan, dry to moist	-193,81			$\langle - \rangle$			
:	SAND, grayitan, dry to moist			61	$ \nabla$			0
	to-Joseph of 220 08 POC		DENTONITE					İ
-320	 tan/orange, moist at 320.0ft BGS some light gray clay inclusions at 321.5ft BGS 		BENTONITE		\setminus			
				62	X			0
- 325 -	SANDY CLAY, tan/gray, saturated	-203.81			$\langle \cdot \rangle$			ļ· -
				63	X			0
-330					$\langle - \rangle$			í
	- some clay inclusions, wet at 331.0ft BGS			64				0
	CLAY, very stiff, tan/gray	-211.81			$/ \setminus$			
-335	SAND, orange/brown/tan	-213.81			\setminus			
				65	X			. 0
-340					$\langle \cdot \rangle$			
	•			66	X			0
-345 —	OANDY OLAY for Andrews	-223.81			$\langle - \rangle$			
	SANDY CLAY, firm, tan/orange - very stiff dark gray clay at 346.0ft BGS	ļ		67	\bigvee			o
	,				$/ \setminus$			
-350					∇Z			
-	SAND, gray/tan	-231.81		68	XI			0
-355	- Groundwater sample collected at 355.0ft BGS	-233.81	WELL DETAILS					
	END OF BOREHOLE @ 355.0ft BGS		Screened interval:					
-360			-48.81 to -58.81ft AMSL 170.00 to 180.00ft BGS	ľ				
			Length; 10ft Diameter; 2in					
			Slot Size: #10					•
- 365			Material; S.S. Sand Pack:					
-360 -365			-43.81 to -63.81ft AMSL 165.00 to 185.00ft BGS					
-370			Material: SILICA SAND	İ				
			Screened Interval:					
- 1		1	-83.81 to -93.81ft AMSL	1				



Page 6 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61 S/I/D1

DATE COMPLETED: February 22, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITOR INSTALLATION	~	-	SAM		
		AINOL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PIO (mnn)
-380 -385			205.00 to 215.00ft BGS Length: 10ft Dlameter: 2in Slot Size: #10 Material: S.S. Sand Pack: -78.81 to -98.81ft AMSL 200.00 to 220.00ft BGS					
- 390 - 395			Material: SILICA SAND Screened interval: -148.81 to -158.81ft AMSL 270.00 to 280.00ft BGS Length: 10ft Diameter: 2in Slot Size; #10 Material: S.S.	-		•		
-400			Sand Pack: -143.81 to -163.81ft AMSL 265.00 to 285.00ft BGS Material: SILICA SAND			-		
-405								
-410								
-415					i			
-420								
425								
430								
435	••							
440								
445								



Page 1 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002 DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITOR INSTALLATION	-		SAM	т	
	GROUND SURFACE TOP OF RISER	121.15 121.05		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
							ź	G C
	SOIL, brown, some vegetation							
		116.65		1	\times	İ		o
-5	SAND/soil, rock, brown/orange	·						_
				2	X			0
-10 -								
_				3	X			0
-15 - -								
				4	X			0
-20			2" Ø BLACK STEEL RISER					
-			RISER	. 5	Х			0
-25 -	- some clay inclusions, tan/black at 25.0ft BGS	95.15			$\langle \cdot \rangle$			
	CLAY, stiff, moist			8	X			0
-30	- very stiff clay at 29.0ft BGS				$(\!$			i
		87,95		7	X			0
-35	SAND, tan/black				(-)		-	
	·			8	XI			0
-40	·		CEMENT/ 6%		$\langle \cdot \rangle$			
			CEMENT/ 6% BENTONITE GROUT		X			0
-45	- stiff clay at 45.0ft BGS	į			$\langle \cdot \rangle$			
				10	\bigvee			0
-50				Į	$\langle \rangle$			
	- black, gray clay inclusions, moist at 52.0ft BGS			11	\bigvee			0
- 55	- no clay at 54.0ft BGS	66,15			\triangle	ı		
	SANDY CLAY, tan/orange, wet - sand, wet at 56.0ft BGS			12	\bigvee			٥
-60		61.15			\triangle			-
	CLAY, dark gray, moist	01.10			\bigvee			0
- ee				13	\bigvee			Ū
-65					$ egthinspace{1.5em} $			_
-70	SAND, stiff, gray/tan, clay inclusions, light gray	53.15		14	Λ			0
				K				
				15	X			0
	TES: MEASURING POINT ELEVATIONS MAY CHANGE; REF		YUA YUA					



Page 2 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION			SAM		T -
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	3
	- gray/orange layering, moist at 75.0ft BGS			18	X			1
-80	- tan/orange, moist at 80.0ft BGS			17				
-85	- wet at 85.0ft BGS				\ominus			
-90			CEMENT/ 6% BENTONITE GROUT	18	\bigcirc			
-95			GROUT	19	\triangle			
-100				20	X			(
				21	X			(
-105				22	X			(
-110				23	\bigcirc			c
-115	 light gray clay inclusions at 114.0ft BGS light gray clay inclusions at 115.5ft BGS 			24				o
-120	- some gray clay at 120.5ft BGS		2" Ø BLACK STEEL RISER	k	$\langle \rangle$			
-125	·		MOER	25				0
-130	- Groundwater sample collected at 130.0ft BGS			26	Δ			0
		-13.35		27	X			0
-135	CLAY, red/brown, moist - dark gray clay, very stiff, dry at 136.0ft BGS			28	X			0
-140				29	$\langle \rangle$			0
-145	- wet at 145.0ft BGS			_ K				a
-				30	\bigvee			u



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PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION		T .	SAMI		
R pGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	Č
	- dry to moist at 151.0ft BGS			31	X			(
- 15 5			CEMENT/ 6% BENTONITE GROUT	32				,
-160	SAND, brown/orange, saturated - light gray clay inclusions at 161.5ft BGS	-38.85		33				
-165				34				,
-170				35	Θ			
-175	- stiff clay at 173.0ft BGS - stiff clay inclusions at 177.0ft BGS				()			
-180	SAND, with clay inclusions, gray/tan	-58.85		36	Å			
-185	- no clay at 183.5ft BGS - Groundwater sample collected at 185.0ft BGS			37	$\langle \rangle$			{
-190	- dark gray/black with some clay inclusions at 191.0ft	-70.35	2° Ø BLACK STEEL RISER	38	$\langle \rangle$			Ċ
-195	BGS CLAY, stiff, light gray/bright orange SAND, some clay, light gray/tan orange	-73,85	RISER	39	\triangle			C
200	CLAY, stiff, gray, with tan/orange sand	-78.85 -79.85		40	A			C
205	SAND, orange/brown, wet	,5,55		41	Δ			٥
210	- clay inclusions at 210.0ft BGS			42	X			0
				43	X			0
215	 tan/orange at 215.0ft BGS stiff sandy clay, tan/orange at 219.0ft BGS 			44	X			0
220	- stiff clay inclusions at 220.0ft BGS			45				0
	<u>[ES:</u> MEASURING POINT ELEVATIONS MAY CHANGE; R		WA WA			L		



Page 4 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION		·	SAMI		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CLAY, stiff, tan/orange sand, wet	-103.85		48	X			0
-230				47	X			0
-235	SAND, brown/tan, reddish, wet - clay, stiff at 236.0ft BGS	-113.85	CEMENT/6% BENTONITE GROUT	48				0
-240	CLAY, stiff, dark gray - wet at 243.0ft BGS	-118.85		49	\Diamond			0.4
-245	- Wol at 243.01 DGG			50				0
-250	SAND, tan/orange, wet	-128.85		51	\Diamond			20.
-255	- Groundwater sample collected at 255.0ft BGS				Θ			
-260				52	$\left\langle \cdot \right\rangle$			12.
-265				53	$\langle \rangle$			13.:
-270			2" Ø BLACK STEEL RISER	54	\triangle			24.4
-275	SANDY CLAY, gray/orange, stiff	-150.85	RISER	55	Δ			10.3
-280	SAND, light gray clay inclusions, some red	-156.85		58	Δ			6.0
-285 —		-163.85		57	X			0.8
	CLAY, very stiff, gray			58	X			0
-290								
295								
NO1	TES: MEASURING POINT ELEVATIONS MAY CHANGE; F	REFER TO CU	PRENT ELEVATION TARLE	L				



Page 5 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002

DRILLING METHOD: 6" ID ROTASONIC FIELD PERSONNEL: L. HAMILTON

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITOR INSTALLATION	~		SAME		
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(سرم) راو
-305	SANDY CLAY, pink/red gray, moist. Groundwater sample collected at 305.0ft BGS	-183.85	CEMENT/ 694	59	X			C
-310 -315	SAND, gray/tan, dry to molst	-193.85	CEMENT/6% BENTONITE GROUT	60	X			(
-320	- tan/orange, moist at 320.0ft BGS - some light gray clay inclusions at 321.5ft BGS			81 82	\bigvee			· ·
-325	SANDY CLAY, tan/gray, saturated	-203.85		63	$\langle \rangle$		_	. (
-330	- some clay inclusions, wet at 331.0ft BGS CLAY, very stiff, tan/gray	-211.85		64			•	
-335	SAND, orange/brown/lan	-213.85	2* @ BLACK	65	X			C
-340 -345		-223.85	STEEL RISER	66	X	-		ć
-350	SANDY CLAY, firm, tan/orange - very stiff dark gray clay at 346.0ft BGS			67	M			o
-355	SAND, gray/tan - Groundwater sample collected at 355.0ft BGS	-231.85		68	X			0
-360	CLAY, stiff, gray, moist	-236.85	BENTONITE CHIPS	69	A			19.
365	SAND, wet, little clay	-244.85	SAND PACK	70 71	$\langle \rangle$			10. 53.
370			WELL SCREEN	72	$\langle \rangle$			45.



Page 6 of 6

PROJECT NAME: HOOKER/RUCO

PROJECT NUMBER: 6883

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-61D2

DATE COMPLETED: March 12, 2002

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITOR INSTALLATION	~		SAM		
		AMOL		NUMBER	INTERVAL	REC (%)	'N' VALUE	, 414
	SANDY CLAY, tan, wet - tan/orange clay, stiff at 376.0ft BGS	-253,85	SAND PACK	73	X			0
-380	SAND, tan with some gray clay	-257.85			$\langle \cdot \rangle$			
-385				74				2
- 390				75	X			1
390	·		BENTONITE	76	X			N
-395	•			77				
400				74	()			
405	- Groundwater sample collected at 405.0ft BGS END OF BOREHOLE @ 405.0ft BGS	-283.85	WELL DETAILS	78	\triangle			(
-410	END OF BUREFIOLE & 403.01 BGS		Screened interval: -243.85 to -253.85ff AMSL 365.00 to 376.00ft BGS					
			Length: 10ft Diameter: 2in Stot Size: #10					
-415		,	Material: S.S. Sand Pack: -238.85 to -258.85ft AMSL					
-420			360.00 to 380.00ft BGS Material: SILICA SAND	į				
-425								
-430								
	•		·					
-435								
440								
445								

			STRATIGRAPHY LOG (OVE			1)						PAGE	_/ OF	4	
	PROJI PROJI CLIEN		BE HOOKER RUCO DRILLING CONTRACTOR BOAR LO- DRILLER GSHT SURFACE ELEVATION	• •			DATE	/TIME	NATION STARTE	D	1W-	il			
	TOCY.	TION	HICKSVILLE, NY WRATHER (A.M.)				DRILL	Ling M	COMPLE ETHOD	581	ماد				
COTTO	ATIGRAF	VIV.C	SAMPLE DESCRIPTION				CRA	SUPER	VISOR _	7 ,	Daly			<u> </u>	
118	TERVAL	S	ORDER OF DESCRIPTORS-	\vdash	S				LE D		LS	S I		C A H N	G R
(DEPTHS F R	IN IL/	m BGS	SUIT TIPE STABOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P	A M M P E L T I H		SPLI (REC	REC T SPO CORD	RATION ORD ON BLA N-VALU VERIES	OWS JES		A N M T P E L R	P / I F I I	E A M L I S I S I S	A I N
M M	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O	6"	6"	6"	6"	N	R	E V A L	D (ppm)	A I L S	I Z E
0		37	tan brown med-coarse sand and gravel										0.0		-
		<u> </u>	Cobbler, loose												
37		49	tan brown + reddish brown fine to medium	ļ	ļ								147		
			Squil dry , Strong Odor at 45-49' \$2049'	<u> </u>	1	-					 		77/		
100			Sour												
49		5-7	tan brown fine-medium sand, loose		<u> </u>								0.0		
57		74	tan brown to light gray medium sand, loose										0.2		
74		77	light gray flow sand + silt, firm										0,0		
77		8i	light gray + tan brown fine sand trill, firm										0.0		
81		97	tan brown + light gray medium sand, loose										0,4		
97		104	light gray + tan brown the sand +5:11, trace clay										8.0		
		<u> </u>	firm	-	-	ļ					ļ				
	NOTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:	<u> </u>	<u> </u>	TOPSO	L THICK	NESS _	l		L	<u> </u>	1	İ	
C	AND DIMMENT	3	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE NOTES:	ENGTH,	AND SAM	IPLE IN	TERVAL				•				



	PROJI	ECT NUM	STRATIGRAPHY LOG (OVE. BER 6583 DRILLING CONTRACTOR DRILLING CONTRACTOR DRILLING CONTRACTOR DRILLING CONTRACTOR DRILLING CONTRACTOR DRILLING CONTRACTOR WRATHER (A.M.) (F.M.)			I)	DATE DATE DRILL	TIME TIME ING M	NATION STARTI COMPLI ETHOD VISOR	ETRD_	1/30/) (t	<u>Z</u> or	<u>4</u> ==	
STE	ATIGRAP	нтс	SAMPLE DESCRIPTION						LE D						
	TERVAL.	9	ORDER OF DESCRIPTORS: SOL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S	S A M M		I	ENET	RATION		<u></u>	S I A N T P E L R E V	P /	C A H N E A M L I Y C S	G R A I N
FR			GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	M P	PE		(REC	CUBD.	N-VAL VERIES	IRS		P E L R	D F I D	ç ş	
0 <u>M</u>	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E #	I H N O G D	6"	6"	6"	6"	N	R	E V A L	Ď (ppm)	A I L S	S I Z E
164		117	light gray Medium Sand, some fine and, loose										0.3		
117		130	light gray + tan brown & some time sand, Stiff										1.4		
130		131	gray medium sand, sweet odor, loose										10.6		
131		157	tan brown + light gray fine medium sand, firm										4.6		
157		177	tan brown + light gray medium sand, loose										2.4		
177		197	light gray Mudium Sand, loose										1.7		
197		207	tan brown time sand, firm										1. (
207		215	tan brown fine sand toilt, clay leases, firm										4.3		
215		220	light gray silty clay , Stiff								ļ		0.8		
220		221			-	 - 	-			-	 		4.6	\vdash	
	NOTES AND OMMENT	.	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LE			TOPSOI		NESS .					1		
		_	NOTES:	-14114	THE OFF	1141									



	PROJ	NT	STRATIGRAPHY LOG (OVE BER 6587 DRILLER SURFACE ELEVATION WEATHER (A.M.) (P.M.)			 4)	DATE DATE DRIL	TIME TIME	GNATION STARTI COMPL CETHOD RVISOR	ETED _	MW- 1/281 1/321 611.6	70 70 70	: <u>3</u> of	<u>4</u> 	
I IN	ATIGRAP VTERVAL	.s. 1	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:		s	1			PLE D		IS			C A H N	G R
(DEPTHS F R O M		/m BGS	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	M M P E L T I H		SPL (RE	REC IT SPC CORD	RATION CORD CON HL N-VAL OVERIES	OWS		S I A N P E L R	P / D F I D	E A M L I Y C S A I L S	A I N S I
	T	Ō	SAMPLE IS TOO DRI TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6"	6"	8*	N	R	A L	(ppm)		Z
227		234	tan brown fine sand +silt, firm , trace clay	_	ļ <u>.</u>	ļ	ļ						1.7		
234		244	dark gray / black Silty Clay, Very stiff										0.0		
244		247	tan brown medium sand, loose						-				10.7		
247		257	tan brown medium sand, loose				-			_			26.7		
			The state of the s		 				\vdash		 	 	20.1	 	
265		277	tan brown + light gray time sand + silt, firm								厂		3.1		
277		292	tan bosun + light gray fine sand + silt, firm										2.5		
292		297	tan brown tim-medium sand, loose										0:3		
297	<u>_</u>	302	tan brown tine-medium sand, loose		-								1.9		
302	·	000													
202	<u>'</u>	335	dork gray/black 5: Ity clay, Very 51 ff	<u> </u>	 	—		-		<u> </u>	<u> </u>	L	0.0		
	NOTES AND MMENT:		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LE					KNESS .				<u> </u>			



	PROJ	ECT NAM	STRATIGRAPHY LOG (OVE			4)					ИW-	PAGE	<u>4</u> or	4	
	CLIE	m_G	HI SUIDEACE DI BUATTON				DATE	DESIG	START	ED	1/28/ 1/36/	/1			
	LOCA	TION H	WEATHER (A.M.)				DRIL	LING M	ETHOD	500	' ے رُا	-			
			(P.M.) SAMPLE DESCRIPTION								Dely				
11	ATIGRAF NTERVAL	.5	ORDER OF DESCRIPTORS.	 —	В	Υ		SAME			LS			C A H N	G R
F R	S IN ft,	m BGS	SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A P L	M M P E L T		SPLI (RE	PENETI REC T SPO CORD : RECO	ORD ON BI N-VAL	OWS		S I M T P E L V	P / I F	E A M L I Y C S	A I N S
0 M	A T	0 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	NO GD	6.	6"	6*	6"	N	R	E V A L	I D (ppm)	A I L S	I Z E
335		347	light gray fine-medium sand, loose										0.3		_
	341		END OF BOZING							-	 				
		<u> </u>		<u> </u>											
				-	-	 			ļ		├	ļ		<u> </u>	
											ļ. <u></u>				
					<u> </u>	-			-	-			ļ	ļ	
				-	ļ	ļ				-	<u> </u>		ļ		
					<u> </u>					<u> </u>	ļ ļ				
		<u> </u>													
				\vdash	 	-	-		-		├-		 		
				_	<u> </u>	<u> </u>			_	<u> </u>	<u> </u>		<u> </u>		
	<u> </u>		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER	<u> </u>	<u></u>	TOPSOL	LTHICK	(NESS _	<u> </u>	<u> </u>					<u></u>
	NOTES		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:												
C	AND OMMENT	23	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINDTES:	ength,	AND SAM	(PLE INT	ERVAL								



ROJECT NAME: HOOKEY RUCO	2/-/.1
ROJECT No: 6883	
CLIENT: GSHT	DRILLING METHOD:
OCATION: Hicksville, NY	CRA SUPERVISOR: S. Daly
	ROAD BOX
MAI _	GROUND SURFACE
	CONCRETE COLLAR
1.44 1.541	
	SAND / GRAVEL
	GROUT TYPE: Portland coment / bentonite
i i i i i i i i i i i i i i i i i i i	GROUT TYPE: 101 Tlans Cement / bentente.
	7"1 220 1"1 261
. 3	BOREHOLE Ø: 7" to 229 6 to 350' In
	MONITORING WELL Ø: 2 in
(3	MONITORING WELL Ø: 2 In
	· · · · · · · · · · · · · · · · · · ·
TOP OF SEAL AT: 186 #	SEAL TYPE: Bentante Chips
TOP OF SCREEN AT: IGG #	V - []
	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 206ft	SCREEN: Ø: 2 in SLOT SIZE: 10
TOP OF SEAL AT: 211 ft_	
TOP OF SEAL AT.	0-1 . 11.
- 	seal type: Bentonite Chips
BOTTOM OF SEAL AT: 241 ft	
TOP OF SCREEN AT: 246 #	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 2 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 256 ft	
TOP OF SEAL AT: 25:1 ft	SEAL TYPE: Bentante Chips
	BOTTOM OF HOLE AT: 347 ft
	orated Louvre Other:
SCREEN MATERIAL: X Stainless Steel HOLE DIAMETER: 6" + 347' 7" + 207	PVC Other:
	inin
DEVELOPMENT: METHOD: Air (iff	DURATION:

	TOCA	TION H.	Hooky, Rule DHILING CONTRACTOR BOARD Lon DRILER STATE SURPACE RIEVATION CESVILLE, NY WEATHER (A.M.) (P.M.)				DATE DRILL CRA	/TIME /TIME ING M SUPER	COMPLI ETHOD VISOR	5 o 5 o	rie Paly	V			
110	TIGRAI TERVAI IN ft	.8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	A M M P E L T I H		EPLI (REC	SAMP REC T SPO CORD I RECO	RATION ORD ON BL	OWE	S	A N M T P E L R	P / D F	CHEMIC ASIS	G R A I N S I
O M	A T	T 0	NOTE: PLASTICITY DEFERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	6"	6"	6"	6"	N	R	Ä	(ppm)	r s	Ż E
0		37	for brown medium-coarse sand+ gravel, fine sand										0.0		
37		49	light tan brown medium sand, some gravel, loose										0.0		
49		57	light brown + light gray fine sound + sitt, firm										Ø. 0		
51		73	light gray medium And, loose										0.0		
73		77	light gray fine sand + sitt, firm										0.0		
77		97	tan brown + light gray medium sand, loose			-							0.0		
97		117	tan brown fine - modium stand + 5:14 , firm										0.0		
117		132	tan brown fine-medium sand & silt, firm, some clay pockets, Slight Sweet odar										1./		
(NOTE: AND COMMEN		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINCIPES:						<u> </u>				<u> </u>		



	PROD	ECT NUM	Hode, Ruid Drilling Contractor Boch Land Brilling Contractor Brill			DATE/TME STARTED 3//3/ii DATE/TME COMPLETED 3//4/ii DRILLING METHOD Jonic CRA SUPERVISOR 5. Daily									
IN	TERVAL IN 1t,	.8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	5 A W P L	S A M M P E L T		SPL (RE	PENETI RECO T SPO CORD I	RATION ORD ON BL N-VAL	ows ues	S	S I A N M T P E L R	P / 1 F 1	C H M L Y S I S	G R A I N
R O M	Å	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	6"	6.	6. VFCO	6"	N N	R	E V	(ppm)	LS	I Z E
32		137	light gray medium sand, loose, no oder										0.6		
37		157	light gray + light brown fine-medium sand, some sittem										0.7		
157		165	light brown fine - medium Sand + Silt, firm										0.4		
165		177	light brown medium sand, loose	-									1.2		
177		192	light brown /light gray medium sund, loose										1.1		
192		197	light brown fine-medium sand, firm										0.5		
197		207	fun brown medium sand, some time sand estill , fir m					_					0.8		
201		227	tan brown fine squal tsilf, some clay, firm			 	ļ	-					1.6		
227		238	fan brown medium sand, some fine sand + silf, firm		-					ļ		ļ · · ·	2.2		
0	NOTES		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVER' NOTES:			•					I		1		



	FROJE	אנטא זיג ד ק	Hooke Rue DRILLING CONTRACTOR Board Long DRILLING SHE SUPPLIE SUPPLIES SUPPLIES SUPPLIES SUPPLIES (A.M.) (P.M.)	•			DATE/ DATE/ DRILL CRA 2	TIME TIME ING M SUPER	nation Starte Comple Ethod Visor	D 3/1 TKD 3 501 5. 1	7/11 1/4/1 2/4 Daly				
IN	TICIRAP TERVAL IN It/	S	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, ORDATION/STRUCTURE, COLCUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	8 M M P E L T		SPLIT	ENETE REC 8PO ORD 1	N-ATI	owe Jes	S	S I A N M T P E L R	P / I P I I	C A L L S	G R A I N
R O M	Ā	10	MOISTURE CONTENT, SUPPLEMENTANT DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L B	I H N O G D	6"	6"	6"	VERIES 6"	') N	R	E V	D (ppm)	LS	S I Z E
38		247	dark gray silty clay, stiff								-		0.0		
.47		251	tan brown medium sand, some fine squet silt, loose										0.3		
57		277	tan brown medium sand, some fine sand i silt, ficon clay lenses at 273-276										11.5		
เท		297	fan brown + light gray fine sand + sitt , firm medium sand layer @ 280-285'										5.0		
297		302	ton brown fine- medium squol + silt, firm										0.5		
302		332	dark gray Silty Clay, Stiff				-			_			0.0		
332		340	light gray fine sand + silf. firm	<u> </u>	-				<u> </u>				0.0		
340		341	light gray fine-medium sand, loose										1.7		
	347		EARL OF DOZING DEPTH OF FIRST GROUNDWATER ENCOUNTER			TOPEO	IL THICK	UEEE			<u> </u>				
(notes and commen		WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY L NOTES:												



PROJECT NAME: Hooler Ruce	HOLE DESIGNATION: MW-72
PROJECT No: 6 + 83	DATE COMPLETED: 3/16/11
CLIENT: GSHI	DRILLING METHOD: Jonil
LOCATION: Hicksville, NY	CRA SUPERVISOR: S. Daly
	ROAD BOX
143	GROUND SURFACE
	OONODETE COLLAD
[•] [CONCRETE COLLAR
100 J	3 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
	SAND / GRAVEL
979	
The state of the s	
E E E E E E E E E E E E E E E E E E E	GROUT TYPE: Portland Cement/bentonite
Signal Control of the	BOREHOLE Ø: In
	MONITORING WELL Ø:In
#165.	
	MONITORING WELL Ø: 2 in
TOP OF SEAL AT: 190 #	SEAL TYPE: Bentonite Chip
BOTTOM OF SEAL AT: 195 ft	
TOP OF SCREEN AT: 200 ft	PACK TYPE: SAND, SIZE #0
214	SCREEN: Ø: 2 in SLOT SIZE: 10
BOTTOM OF SCREEN AT: 210 ft	
TOP OF SEAL AT: 215 ft	
openate.	SEAL TYPE: Bentanite Chip
BOTTOM OF SEAL AT: 255 ft	
TOP OF SCREEN AT: 260 ft	PACK TYPE: SAND, SIZE #0
TOP OF SCREEN AT:	
22.	SCREEN: Ø: 2 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 276 ft	SEAL TYPE: Rentonite Chio
TOP OF SEAL AT: 271 ft _	SEAL TYPE: Bentonite Chip BOTTOM OF HOLE AT: 347 ft
SCREEN TYPE: X Continuous Slot P	Perforated Louvre Other:
<u></u>	PVC Other:
CREEN MATERIAL: X Stainless Steel	
DEVELOPMENT: METHOD: Airlift	1 DI 02 DI 02 DURATION: 2 + 2,5hrs (900 + 1,000)

Project nu Client	MB HOOK C PUCO MBER 6883 MBILLER G 5 III SURFACE REVATION H: - (CSV) C N Y WEATHER (AM.) (P.M.)	BURPAGE RLEVATION						50 2 ETED :	2/10 Nic Only	13		<u>4</u>	
STRATIGRAPHIC INTERVALS DEPTHS IN 11/m BG	OBDER OF RESCRIPTIONS.	S A M	B A M M P E		I SPLI	PENET	RATION ORD ON BL	OWS	S	8 I A N M T P E L R	P /	C A N L C S I	G R A I N
R T T	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P L E	LT IH NO	6"			N-VAL VERIE:			L R E V	D F	C S A I L S	8 1 2
0 31	tan brown medium to coarse sand + gravel	-	Gp	0	. 0	-	В	м	R	<u>ī</u>	(ppm)		E
	Some fine sand + silly loose &		<u> </u>	_							10.0		
37 50	37 50 light gray fine sand +5:11, loose						_				0,0		
	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	<u> </u>								-			
50 57	tan brown fine med san!, some sit, firm										0.0		
		-			-	-	-		ļ		 		
57 65	tan brown + light gray fine sand + silt firm										0.2		
	orange mottles	-		<u> </u>	├	_				_	 	-	
65 77	light brown medium sand, loose										0.7		
77 84	light brown medium sand, 1005e										0.0		
84 92	light gray tine sand trilt, firm	-			-						0.0		
											1		
92 95	tan brown medium sand, loose	ļ <u> </u>		ļ	 			ļ			0.0		
NOTES AND COMMENTS	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINDIES:						<u></u>		<u> </u>		1		1



BTRATIGRAPHIC INTERVALS PTHS IN ft/m	SAMPLE DESCRIPTION					ING M	COHTS	<u> 5.,</u>	nic Daly			_	
R	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, ORADATION/STRUCTURE, COLQUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	B M M P E L T I H		EPLI (REC	ENETR RECO 1 SPOO ORD N	ATION	ows Ues	S	S I A N P E L V	P / D F I	C A H A M L I Y O S A I I S	G R A I N B I
\$ 1 5 9	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE BAMPLE IS TUD DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	F	N O	6"	₿*	6"	6*	И	R	L L	(ppm)		Z
7 [1											6. v		
5 (1	light gray -fine-medium sand, loose										0.2		
7 1	light gray fine-medium rand, loose										0.9		
13	light gray medium Sand, loose, slight odor								<u> </u>		1.3		
57 1	7 light gray medium sand, no odor										0./		
17 17	1 No Recovery		ļ							ļ			
77 /	7 fan brown medium Sand, loose, slight oder										1.5		
17 2	7 fan brown fine-medium sand, some silt, firm, no odur										0.8		
.07 2	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS			TOPSO	L THICK	NESS _					3.1		

	CLIE	NT	Hosker Ruco DRILLING CONTRACTOR Boart Loa DRILLER DRILLER BURFACE RILEVATION FOLICAVITIE, MY WEATHER (A.M.) (P.M.)				DATE, DATE, DRILL CRA	ing Mi Supery	STARTE COMPLI CHHOD VISOR	10 _ 7 ETRO 1 	2/1°, 1, '< Duly	<i>I</i> /ti			
IN	TIGRA TERVA	LS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:	_	8			SAMP			<u>s</u>	I B		CA	G R A
FR	TH 10	711 308	SCIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A N P	M M P E L T I H		(REC	RECO F SPOI ORD I RECO	ON BI	UES		A N M T P E L R E V	P / I F	M L C S A I L S	I N B
ů M	A T	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IN TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	N O	8"	6"	6"	6"	N	R	E V A L	(ppm)	гs	I Z E
120		230	fan brown medium sand, loase										1.8		
230		247	tan brown fine sand tilt, clay 1 234-235										0.5		
			Com			 									
247		257	tan brown + light gray layered fine sand + Silt, firm			 							0.3		
257		267	tan brown medium sand, loose, oder			-							18.5		
267		277	tan + reddish brown medium sand, loose, odur								ļ		22.6		
277		287	tan preddish brown madium sand, loase, odar			-					 		/3.5		_
287		297	ten i reddish brown medium sami, loase, oder								-		6.4		
297		307	tan bown medium sand, loose, slight odor				1						17.4		
301		317	light gray fine-medium sand + silt from	-							-		6.7		
	NOTES AND MINEN		DEPTH OF BOREHOLE CAVING				XL THICK				<u> </u>	1		.l.;	



	CLIRA	<i>ਦ</i> 15	STRATIGRAPHY LOG (OV Hooke, Ruco BER 665 SHE SURFACE BLEVATION VEATHER (A.M.) (F.M.)				DATE, DATE, DRILL CRA	ing Mi Superv	STARTE COMPLI CTHOD CEOR	ETRD_	Pal	/11 P/11			
IJ	•		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SLEE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT. SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE	3 M P L	S M M P E L T I H N O		SPLT (REC	SAMP PENETR RECO T SPOO CORD N RECOV	AATION ORD ON BL N-VAL VERIES	ows ues s)		B I A N T P E L R E V	P / D F I D	C A N B L Y S I S L S	G R A I N S I Z
<u>й</u> 317	A T	6 327	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	1	G D	6"	6"	6"	6"	И	R	Ĺ		<u>Ē</u>	
27		347	light gray + reddish brown fine - medium same, louce										//.9		
	347		END OF BORING												
				-										<u> </u>	<u> </u>
				-											H
				+											
	NOTES		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS:	<u> </u>		TOPSO	YL THICK	(NESS _							
notes LND Comments		3	NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES	LENGTH,	AHD SAI	IPLE IN	TERVAL.								

PROJECT NAME: Hooker Ruco	HOLE DESIGNATION: MW-73
PROJECT No: 6883	DATE COMPLETED: 2/11/11
CLIENT: GSHI	
LOCATION: Hicksville, NY	_ CRA SUPERVISOR: 5. Daly
	— ROAD BOX
144	GROUND SURFACE
│ ╱ ╎ _{┍┸┰}	1
	CONCRETE COLLAR
100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg 100 mg	1.60 kg/4/3
	SAND / GRAVEL
	GROUT TYPE: Portland Coment/bentonite
7 × ×	BOREHOLE Ø: 6 In
	MONITORING WELL Ø: 2 in
	MONITORING WELL Ø: 2 in
TOP OF SEAL AT: 210 ft	SEAL TYPE: Bentonite Chips
TOP OF SCREEN AT: 220 ft	5
	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 230 ft	SCREEN: Ø: 2 in SLOT SIZE: 10
TOP OF SEAL AT: 235 ft	
	seal type: Bentonito Chips
	SEAL TIPE: OWNER STAPS
BOTTOM OF SEAL AT: 255 ft	40
TOP OF SCREEN AT: 260 ft	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 2 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 270 ft	SEAL TYPE: Bentonite Chip
TOP OF SEAL AT:	BOTTOM OF HOLE AT: 347 ft
Latitude Communication Communi	
SCREEN TYPE: Continuous Slot Perfora	ated Louvre Other:
	<u> </u>
SCREEN MATERIAL: X Stainless Steel	PVC Other:
HOLE DIAMETER: 6" to 347 7" to 23	D/ in

	CUIE	rr GS	CECVILL AV WEATHER (A.K.)			-	DATE DATE DRILL CRA	SUPERV THO ME	TARTE COMPLI THOD ISOR	D _ Y MED _ S S = A ,	VIII Daly		9/11		
1N	TIGRAT FEIEVAL IN It	43	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSTRUCT, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P	S M M P E L T		SPLI (REC	PANETR RECO T SPOU CORD 1	ATION ORD ON EL	ewo Est	S	S I A N M T P E L R	P / 1 F D F	CHRNICA	O R A I N
R O M	Ā	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L R	NO	θ'	6'	6"	6"	N	R	E V	D (ppm)	LB	I Z E
0		37	tan brown medium coarse stand 1 gravel loose . Some fine rank + 5:11										0.0		
37		5^7	tan brown fine metur sand, some gravel, loose IC 50'										2.5		
57		75	light tan light gray + reddish brown predivar										0.2		
75		87	light gray fine-medium same! loose										0.2		
87		97	dark gray/black 5. Ity clay, 5tiff										0.0		
97		112	tan brown fine sand+ sit, from		-		-	-					0.1	-	
112		117	No Recovery			-				-			-	-	
[[7		147	light gray fine-medium Sand, some silt, loose	1		1	+	-			_	-	6.2		-
c	NOTES AND OLDGEN	=	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-YALUE, SAMPLE RECOVERY (NOTES:				OIL THIC								•



	PRO	uect hun urt <u>C</u>	4. ckswile (U Y WHATER (LU) (P.U)				DAT DAT DRII	TING 1 C\LINKR C\LINKR	START COMPI COMPI	TED	MW. 4/29 5/1/ 00/4	/11 / 1/			
11	ATTORA TENYA	7.3	SAMPLE DESCRIPTION							DETAI				C A	
HTEED) TEE TEE TEE TEE	A MI	/m BG8	SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SEE/PLASTIUTY, GRADATION/STRUCTURE, GOSTOR CONTENT, SUPPLEMENTARY DESCRIPTIONS	SAMPLE	S A W P T I H		SPL (RE	PENET REC IT SPC CORD	RATION ORD ON DI N-VAI OVERIE	N LOWS		S I N T P E R V	p / D F I D	E A L E E E E E E E E E E E E E E E E E	R A I N B
147	T	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Į.	N O G D	6"	θ'	8.	6"	N	R		(ppm)	LS	J Z E
		167	ton brown + light gray fine-medium sand										14.9		
					-	-				<u> </u>			ļ		
167		177	tan brown medium sand, loose, slight ador										1.2		
177		187	tan hown medium sand, loose, Slight odor										2.4		
187		197	light gray medium sand, loose, slight oder										1.6		
191		207	tan brown fine - medium sand , some site firm										0.8		
207		227	tan brown fine-molium Sand, loose										1.3		
227		240	tan brown medium sand, luose										Q. d		
240		247	clark gray / black 5:1ty clay st. ff							-			0.0		
241		277	tan brown fine-medium sand, loose												
			DEPTH OF BOREHOLE CAVINO DEPTH OF FIRST GROUNDWATER ENCOUNTER										2.8		
			COMPLETION DETAILS					IESS							
	AND		NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LEN NOTES:	IGTH, A	HD SAM	NE INTE	RVAL								

	PROJ	ECT HUM	EST TILE, MY WEATHER (A.M.) (P.M.)				DATI DATI DEL CRA	DESIGNATIONS TOMB LING M SUPER	START COMPI ETHOD VISOR	ED	5/1/ 1: c Daly	/ પો 'લ			
18		.8 /m BQ8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: 14 SECURITY DETERMINATION PROJECTS ADDITION OF MOISTING IS THE	SAUP	S A M M P E T T H		SPL (RE	SAMP PENET REC IT SPO CORD RECO	RATION ORD ON BI	OWE UES	LS	S I A N T P E L R	P / D F 1 D	CHENICAL	G R A I N B I
M	Ť	Ö	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF TH SAMPLE IS THO DRY TO ROLL (INDICATE IT MOISTURE WAS ADDED OR NOT).	S E	N O	8"	6"	6"	6"	N	R	ı	(ppm)		Z
277		297	Medium sand + Clayey pockets, firm										0.9		_
297		302	fan bown medium Sand, some fine Sand +5:1+										1.0		<u> </u>
302		338	clark gray / black 5:1ty clay, stiff										0.0		
338		347	light gray fine sand, clay lenses, firm										2.6		
	347		End of boring												
-									_		-				
		-			↓	-	-	ļ		 	-		-		_
C	NOTES AND OMMENT		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTED WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: HOTE: FOR EACH SPLITSPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVER HOTES:			·~					<u> </u>			J	

PROJECT NAME: Hooker Ruio	HOLE DESIGNATION: MW-75
PROJECT No: 6883	DATE COMPLETED: 5/2/11
CLIENT: GSHI	DRILLING METHOD: Johi C
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5 Daly
	ROAD BOX
¥	GROUND SURFACE
	CONCRETE COLLAR
and .	GONONETE GOLLAN
	SAND / GRAVEL
(S)	
	GROUT TYPE: Portland Cement / ben honite
3	BOREHOLE Ø:in
	MONITORING WELL Ø: 2 in
- 184	MONITORING WELL Ø: 2 in
	MONITORING WELL D;
TOP OF SEAL AT: 150 ft 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	SEAL TYPE: Bentunite Chip
TOP OF SCREEN AT: 160 ft 1	
TOP OF SCREEN AT: 160 T	PACK TYPE: SAND, SIZE #O
170	SCREEN: Ø: 2 in SLOT SIZE: 10
BOTTOM OF SCREEN AT: 170 ft 1	
TOP OF SEAL AT: 115 ft	
	SEAL TYPE: Bentonite Chip
BOTTOM OF SEAL AT: 220 ft_	
TOP OF SCREEN AT: 225 ft	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 2 In SLOT SIZE: 16
BOTTOM OF SCREEN AT: 235 ft	
TOP OF SEAL AT: 236 ft _	SEAL TYPE: Bentonite Chips
	BOTTOM OF HOLE AT: 347 ft
SCREEN TYPE: X Continuous Slot Perfo	orated Douvre Other:
SCREEN MATERIAL: X Stainless Steel	PVC Other:
HOLE DIAMETER: 6" + 347 7"+	[77'in
DEVELOPMENT: METHOD: A:- 1: (1	DURATION:

	PRO	DECT NUM ENT (1)	STRATIGRAPHY LOG (OVE BER 6833 DRILLER SHI SURFACE REVATION WEATHER (A.M.)	yin	DATE/THE STARTED 2/12/11											
	ATIGRA		SAMPLE DESCRIPTION				CRA	SUPER	VISOR	₹,,	Perly					
(DEPTH	TERVA IN It	LS ∕m. BGS	UKUER OF DECOMPOSE		3					DETAI	LS			CA	G R	
F R O M	A T	T	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIM SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	S M P L E	M M M P E L T I H		SPL (RE	PENET REC IT SPC CORD RECC	ORD ON B N-VAI	LOWS LUKS	İ	A N M T P E L R	F / D F	C A K N E A M L I Y C S A I	A I N S	
O		37	tam breve Med- coerse Vall	#	N O G D	6"	6"	6"	6"	N	R	Ĺ	(ppm)	A Î L S	I Z E	
			tan brown Med-coarse Sand + gravel some fine rand + silt, loose, dry				_	L					0.6			
37		5/2								 			<u> </u>			
		48	tax brown med sand, lock water at 48'										0.7			
48		51	light brown fine sand 15.14 from													
5.7		77											0.0			
		1	tan boom to light gray line sound + Silt, force clay										0, 2			
			11776												\neg	
77		91	light gray + lan brown medium sund , loose					_		_						
91		97					_						0.0			
			light gray to black silty chy stiff										0.0			
97		103	Same													
1200	_										_		0.0			
103		117	charle gray black 5. Hy Clay			-										
			ten brown + light gray silly stay fine sign. from										0.4			
	otes	į n	EPTH OF BOREHOLE CANNG DEPTH OF FIRST GROUNDWATER ENCOUNTER ATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTERHOURS CMPLETION DETAILS:			OP50XL	THICKN	ESS _								
CON	TALL .		ote: for each split—spoon sample, record blow counts, N—value, sample recovery lend otes:	TH, A	ID SAMPL	E INTE	RVAL	-		-	-					

P	ROJECT	GSHI BURFACE REPVATION H. KSVILLE, NY WEATHER (AM) (P.M.)	DATE/THE STARTED 2/12/11 DATE/THE COMPLETED 2/1/11									Ze or	3	
STRATIC INTER DEPTHS IN F R O A	RVALS	SECONDARY COMPONENTS, FELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTIONS NOTE: DESCRIPTIONS	AARY COMPONENT(S), (NATURE OF DEPOSIT), A LATIVE DENSITY/CONSISTENCY, AATION/STRUCTURE, COLOUR, BENTARY DESCRIPTORS TION REQUIRES THE ADDITION OF MOISTURE IF THE LINE CONTROL OF MOISTURE IN MOISTU						etan (ows ues e)		S I N T E R V	P / 1 P I D	C A H N E A H L C S A I L	G R A I N S
17	12	SAMPLE IS TOO DRY TO HOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	1	N O G D	6"	6"	6"	6"	И	R	F	(ppm)	- 3	Z
			 									0.7		
25	13'	. light gray medium sand, loose, oder										7.5		
32	13'	light gray fine send t silt , firm golor	-									1.6		
37	14	light Tray fire sand + sill, firm oder										1.6		
47	16		<u> </u>											
	1142	light gray/ light brown fine-melium sand, some silt	<u> </u>		-					_		5,4		
67	12	tan brown Medium sand, losse, Slight oder	-									1.1		
77	19	1 1 1 1 1 1 1 1 0 co	_											
		tan brown + light Tray fine medium sand from	╁─	 -					-			3.0		_
97	20	light gray Medium send live, oder										2.1		-
.07	72	light gray + fan bown fine sand + silt w/ a pocket	 		 				_					
		of Medium stand (locar) @ 220-224	 	1-	\vdash	-	-		-			3.2		-
NOT.		DEPTH OF BOREHOLE CANNO DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN DEEN BOREHOLE ON COMPLETION AFTER HOURS OF HOURS NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINDIES:				L THICK	NESS _				l			

	LOC	VECT NU	STRATIGRAPHY LOG (OVE DELLING CONTRACTOR BOOK LO DELLING CONTRACTOR BOOK LO DELLER SURFACE REPORTION WEATHER (A.M.) (P.IC.)	-74 1	RDE	N)	DATI DATI DRIL	C/TIMB C/TIMB LING N	STARI COMPI CEVHOL	N/ ED <u>Z</u> LETED <u>-</u>	11210 2114,	76 1 11	: <u>3</u> or	3	
1 3		PHIC LS /m BG	ORDER OF DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DESSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURS, COLOUR, MOISTURE COMPENT, SUPPLEMENTARY, DESCRIPTION,	S A M P L	A M M P E L T I H		SPL (RE	PENET REC IT SPC CORD	PLE I	LOWS	S	8 1 A N M T P E L R	P / D F	C A H N E A L I Y C S A I L S	G R A I N
227	Å	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE DI MOISTURE WAS ADDED OR NOT.).	R	N O	6"	6"	e"		N	R	E V	(ppm)	Ĺŝ	1 2
W		235	tan brown fine-medium Sand +sit , firm										10.8		E
235		250	dork gray/black Silty Clay, 57.ff										0.0		
25,0		251	tan brown figz sand rsilt, some medium sand										49,3		
257		217	tan brown medium rand, loose, oder										27.6		
171		297	ton bown + light gray fine sand wilt, some clayifien						_				0.5		
285		297	light gray medium sand lovce							-					
197	<u> </u>	12							 				0.2		\dashv
7.7	- 	301	tan brown Medium Sand, loose										1.2		\dashv
301		342	dorlegary Iblack sitty clay ivery stiff										0.0		
342		347	light gray fine-medium sand, some silt, firm												
	347		END OF BORING										0.0		
	NOTES		DEPTH OF BORGHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER TOPSOIL THIS WATER LEVEL IN OPEN BORGHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:										L		-
GC	AND	3	note: for each split—spoon sample, record blow counts, n—value, sample recovery lex <u>Notes</u> :	icth, a	ND BANE	7LE INT	ERVAL								

ocation: <u>Hicksville, NY</u>	CRA SUPERVISOR: S. Daly
	ROAD BOX
	GROUND SURFACE CONCRETE COLLAR
	SAND / GRAVEL GROUT TYPE: Portland Cement/ bentonte
	BOREHOLE Ø: 6 in MONITORING WELL Ø: 2 in
	MONITORING WELL Ø: 2 in
TOP OF SEAL AT: 76 BOTTOM OF SEAL AT: 76 TOP OF SCREEN AT: 80	
BOTTOM OF SCREEN AT:	PACK TIPE: SAND, SIZE
TOP OF SEAL AT:	4d 46 45% 5%
BOTTOM OF SEAL AT:	n
TOP OF SCREEN AT: 125	SCREEN: Ø: 2 in SLOT SIZE: /d
TOP OF SEAL AT: 136	TO THE PROPERTY OF THE PROPERT

PROJECT NAME: Hooker Ruco PROJECT No: 6883	HOLE DESIGNATION: MW-76 DI/D2. DATE COMPLETED: Z/15/11
CLIENT: GSHF	DRILLING METHOD: Sonic
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5. Daly
	— ROAD BOX
	GROUND SURFACE
	CONCRETE COLLAR
	CONCRETE COLLAR
	SAND / GRAVEL
	P. 11 1 1 1 1 1 1
	GROUT TYPE: Portland cement/bentonite
	BOREHOLE Ø: in
	BOREHOLE Ø: in
	2
	MONITORING WELL Ø: in
	MONITORING WELL Ø:In
TOP OF SEALAT: 185 #	
TOP OF SEAL AT: 185 ft	SEAL TYPE: Bentonite Chips
TOP OF SCREEN AT: ft	PACK TYPE: SAND, SIZE #0
	□ {
BOTTOM OF SCREEN AT: 205 ft	SCREEN: Ø: 2 in SLOT SIZE: /o
TOP OF SEAL AT: 216 #	A CONTRACTOR OF THE CONTRACTOR
	SEAL TYPE: Bentonite Chips
BOTTOM OF SEAL AT: 260 ft	
TOP OF SCREEN AT: 265 #	PACK TYPE: SAND, SIZE #0
TOP OF SCREEN AT:	
BOTTOM OF SCREEN AT: 275 ft	SCREEN: Ø: 2 in SLOT SIZE: 10
TOP OF SEAL AT: 276 ft	SEAL TYPE: Bentonite Chip
TOP OF SEALAT:	BOTTOM OF HOLE AT: ft
SCREEN TYPE: X Continuous Stot Perforated	Louvre Other:
، سجا	PVC Other:
HOLE DIAMETER: 6'+7"(347' + 207')	<u>) </u>
DEVELOPMENT: METHOD: A:/I:F/	DURATION:

	CHIER	ALIA .	STRATIGRAPHY LOG (OVE. BERN 6883 GS 1127 GLICKS VILLE, NY SURFACE ELEVATION WEATER (A.M.) (P.L.)	gye ev	<u></u>	HOLE DESIGNATION MW-77 DATE/TIME STARTED 2/22/11 DATE/TIME COMPLETED 2/24/11 DRILLING METHOD 520.6 CRA SUPERVISOR 5. Dely									
IN	TIGRAF TERVAL IN It,	E /m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIM SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S A M M P E L T I H		SPLI (RE	PENET	RATION ORD OR HI ON HI	ows Ows	ន	S I A N M T P E L R E V	P / D F I D	CHEMICATE STANFORM	G R A I N B I
N N	A T	O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MDISTURE WAS ADDED OR NOT).	E	N O Q D	8"	6"	8*	8*	N	R	A L	(ppm)		Z E
0		34	tan brown medium-coarse sand + gravel	<u> </u>				<u> </u>			<u> </u>		0.0		
		1	louse, some fines	-	ļ <u>.</u>		-	-			-		 	 	
34		37	tan brown fine sand w/ some medium gand			 	-	 			├-		0,0		-
<u> </u>		/ ريا	10052	 	<u> </u>	 		\vdash			\dagger	\ <u></u>	1	 	
		 				1									
31		57	tan brown to light gray fine sand										0.0		
			tan brown to light gray fine sand			<u> </u>	1	ļ			 	ļ	ļ	<u> </u>	
		100		\vdash	<u> </u>	ļ			_	-	ļ		 	 	├—
57		77	tan brown fine soud, with silly and clayer	╀	 	-	-	-		-	+-		0,0	ļ.—	├─
			12085 C 60-05 , 7.7m	 	+	+	+	+	-	+	+	-	 	┼	† —
77		95	tan besure + light going fine sand, some silt	 	 	 		 	 	\vdash	 	 	0,0	1	1
		1	firm	T								<u> </u>			
										_	_				<u> </u>
95		97	lighty grony silty clay stiff	1_	1	.	-	1_	ļ	1_	1	<u> </u>	00	ļ	1
<u> </u>		1,,	dark gray Silty Clay Stiff	↓_	┼		-	-	 	 			-	<u> </u>	┼
97	-	114	dark gray Silty Clay Still	-	┨		-	+-	+	+		 -	0.0	 -	
c	NOTES AND OMMEN	TS	DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPDON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINDTES:					XNESS				1			



	PROJE	ROT NUME It	THORY RULE BER USY3 BER USY3 BER USY3 BER USY3 BURFACE RIEVATION WEATHER (A.M.) (F.M.)				DATE, DRILL CRA	TIME TIME ING MI SUPER!	COMPLA CYHOD . VISOR _	TED	Paly	4/1		C A I	G
INT	ngraf Erval In ft,	8	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S M M P E L T I H	(RECORD N-VALUES PEDF & RECOVERIES) LR I						n F	H A L I S A L S A L S	RAIN	
M O	A T	TO	NOTE: FLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	N O	6"	ß*	в"	8"	N	R	A L	(ppm)		Z E
14		117	for brown fine-median gond, slight odor, loose			_							0.2		
74		(2.4	The transfer of the second of					-		-			0.4		
11		131	tan brown to light gray medium sand, some fine			lacksquare	-			 			100,7		
			3 (injer, 10 vs. 5) gr. 8(in												
131		157	light gray medium sand, some fine sand trilt			<u> </u>	<u> </u>	<u> </u>		 	-		1.2		
			16052				-	 	ļ	├		-	-	<u></u>	\vdash
151		177	Ca			 		-	 	ļ	+		0.7		
177		197	JAME ten brown tight from milion rout looks stight oder		 	1	 	 				_	0.8		
197		201	tan brown a light gray melion ign. 1. loose, slight oder							_			2.9		
				ļ	_	1	ļ	ļ		-	 	ļ	-	<u> </u>	
207		210	tan brown fine sund 1 sitt, firm, trace clay	-	1	 	-		┼	┼	+-	-	0.7	<u> </u>	-
210		1221	light brown fire-medium rand some silt, fin		╁┈╌	1	+		 	1-	+	 	0,3	 	t
<u> </u>		100	17.02 Marion) Civir / 2 0/100 2 11/11/11												
221		245	light brown line and Esitt, some claye from		ļ		ļ	ļ	ļ	·	<u> </u>	<u> </u>	0.6	ļ	₩
245		247	1 1 1 0 1 god to	_	 	-	+	-	┨—	-	+-	-	2.8	 	+
<u> 195</u>	l	1291	DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER_	<u> </u>	<u> </u>	TOPS	OIL THIC	XNESS			_L •	. 1	1-0		ا
			WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS												
İ	HOTES	I	COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY L												



	CLIRN	er (DRILLER STATE SURFACE REPATION VESTALL, NY WEATHER (A.M.) (P.M.)				DATE, DRILL CRA	ADMIX (COMPLE THOD ISOR	TRI)				G A 1	G
DEPTHS	TIORAF IERVAL IN fl,	.9	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(8) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L E	S M M P E L T I H	İ	EPLI (REC	ENETH RECO 1 SPOO CORD 1 RECO	ATION IRD ON BU	OWE	<u>.</u>	S I N T P E R V	P / I P I	H A L S L S L S L S L S L S L S L S L S L	R A I N S 1
R O M	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ë	N O G D	8"	6"	6*	6"	N	R	L	(ppm)	LS	Ž
241		253	light brown flow sand + silt, firm				-						0,5		_
253		257	light form Medium signel loose										1.7		_
2151		271	light brown medica sund, longe										2.7		
217		2.87	tan brown medium sand, house, some finesandist							<u> </u>	-		9.7		F
237		277	SAME					_			_	<u> </u>	2.8		F
291		307	tan beaun medium sand loose, some line sand sitt			-	_					 	3.2		
507		324	light gray line squartsilt, firm				-				-	 	1.2		F
<u> 324</u>		327	light gray fine median sand, laose			 	-	1		-			9./		F
311		335	light gray fine-pulliva sand, firm, some clay										0.6		
c	NOTES AND DAOLEN	-	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINDIES:				THIC				-				1-



	PROJE	CT NUMB	HOOKE PULL DRILLING CONTRACTOR GULF L. ORR (6883 DRILLER SURFACE ELEVATION L. 455144 WEATHER (AM.) (P.M.)				DATE/ DATE/ DRILLI CRA S	TIME E TIME O NG ME TUPBETU	COMPLI THOD ISOR	10 _ 3 TIBI) _3 	122/ 2/24/ 2/24/ Dell	11' (1)			
EPTH:	ATIGRAP ITERVAL 3 IN ft/	a !	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICTY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P L	A M M P E L T I H		SPLIT	ENETH RECO SPOO	KOITA	OWS UES	S	S I I Y T E R P E R	p / 1 / D F I D	C A H A L Y S I S L S	G R A I N S I
R D M	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	#	N O G D	6"	8"	6"	8,	N	R	, Å	(ppm)		Z
35		3:67	light gray + orange books median sound	1_	<u> </u>								1.3		├
			loose	<u> </u>		-	-						 	├	
	62	ļ <u> </u>	Pull are a could		 	-						 		 	
	347	 	END OF FORING	┪	 				_	\vdash		1	1 -	1	
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						<u> </u>			<u> </u>	ļ	<u> </u>	 			-}
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	 	—			-	+-	+-	┼─	+	+	+	- 	+-	-	+
	-	-		\dashv		-	+	+	十	+	+-	1		1-	1
	-			\dashv		+	+-	+	+	+-	+-	1-		+	1
	٠.,.		DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS			TOPS	OIL THIC	KHESS			-				
			WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER												
	NOTES AND COMMEN		NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVER'	LENGTH	, AND S	AMPLE II	NTERVAL	-							

PROJECT NAME: Hooker Ruce	
PROJECT No: 6883	DATE COMPLETED: 2/26/11
CLIENT: GSHI	
LOCATION: Hicksville, NY	CRA SUPERVISOR: S. Daly
	ROAD BOX
N/A	GROUND SURFACE
	CONCRETE COLLAR
ă» T	CONCRETE COLLAR
[17.7] 13.85 18.	
	SAND / GRAVEL
و ا	GROUT TYPE: Portland cement / bentonite
· ·	BOREHOLE Ø:
	MONITORING WELL Ø: 2 In
· [4]	
	MONITORING WELL Ø: 2 in
TOP OF SEAL AT: 235 ft F BOTTOM OF SEAL AT: 240 ft F	
· · · · · · · · · · · · · · · · · · ·	SEAL TYPE: Bentonik chips
TOP OF SCREEN AT: 245 ft	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 2 in SLOT SIZE: /o
BOTTOM OF SCREEN AT: 255 ft	
TOP OF SEAL AT:	
Charles	SEAL TYPE: Bentonite Chips
BOTTOM OF SEAL AT: 270 ft	
TOP OF SCREEN AT: 295 #	PACK TYPE: SAND, SIZE #0
TOP OF SCREEN AT:	
BOTTOM OF SCREEN AT: 365 ft_	SCREEN: Ø: 2 in SLOT SIZE: 10
TOP OF SEAL AT: 306 ft	SEAL TYPE: Bentonite Chips BOTTOM OF HOLE AT: 347 ft
TOP OF SEAL AT: ΔΟΣ π_	BOTTOM OF HOLE AT: 347 t
SCREEN TYPE:	orated Douvre Other:
SCREEN MATERIAL: Stainless Steel	PVC Other:
HOLE DIAMETER: 6" 10 341' 7" 6	
DESCRIPTION OF THE PROPERTY OF	DURATION:



Page 1 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DRILLING METHOD: 6" ID ROTASONIC

HOLE DESIGNATION: MW-81

DATE COMPLETED: November 2, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S.DALY

LOCATION: HICKSVILLE, NY

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL NEST			SAM		
BGS	GROUND SURFACE	AMSL 121.60		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
	GROUND SUN AGE	121.00				RE	ž	6
5	topsoil SAND AND GRAVEL, some silt, light brown, medium coarse grained sand and gravel, no odour	120.60	CONCRETE MW-81D1	01	4			0.0
10	·		TOP OF CASING 121.07 ft AMSL		4 4 4 4			0.0
15	SAND, medium grained, light brown, no odor	106.60	MW-81D2 TOP OF CASING 121.05 ft AMSL	02	य संस्			
25			CEMENT/ BENTONITE GROUT		.च.च.च.			- 0.0
30	- fine-medium grained sand, tan brown, no odor at 29.0ft BGS							
10			BLACK IRON RISER 2°0 SCH 80 PVC RISER	03	ाच के का जनसङ्ख्या			0.
15	- clay lens from 45.0 to 46.0ft BGS	70.00	2°0 SCH 80 PVC RISER		1. a. a. a.			
55	SAND AND SILT, fine to medium grained sand, tan brown and light gray, orange mottles	72.60	PVC RISER					0.
50	SAND, medium grained, light brown, no odor	63.60 60.60		04	य य य			0.1
65	CLAY, trace sllt, stiff, dark gray							0.
0		47.00	1 64 64 64]		0.
75	SAND, trace silt, medium grained sand, light brown and gray	47.60		05	4 4 4			
75 30 35								0.6
	- fine medium grained sand, light brown and light							



Page 2 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-81

DATE COMPLETED: November 2, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

FIELD PERSONNEL: S.DALY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	<u></u>	T .	SAMI	 1	
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(maa) Cld
	gray sand, no odor at 89.0ft BGS				4 5	1		
95					4			
					2 1			ĺ.
100				06				1.
					4 4			
105			CEMENT/ BENTONITE		4			
			GROUT		2 2			
110					4			
115					4 4	•		
					4	1		3.
120			2°0 SCH 40 BLACK IRON	07				J.
-			RISER	1	4			
125					4			
130	SAND AND SILT, fine to medium grained sand, light	-7.40	CEMENT/ BENTONITE GROUT 2°0 SCH 40 BLACK IRON RISER		1 1			
130	brown and dark gray, no odor				4			0.
135	CLAY, trace silt, stiff, dark gray, no odor	-12.40	2"0 SCH 80 PVC RISER					
			PVC AISER	08				
140				"				0.
145								
150					1 1			
130								
155	•							1.3
			CEMENT/ BENTONITE GROUT 2°8 SCH 40 BLACK IRON RISER 2°8 SCH 80 PVC RISER	09				
160	SAND AND SILT, fine grained sand, tan brown light	-39.40						
105	gray, sweet odor				अन्य स्टब्स्ट स्टब्स्ट अन्य अन्य स्टब्स्ट स्टब्स्ट			5.4
65								
70					1 1			
					4 4			
75								
				10				14.
	DTES; MEASURING POINT ELEVATIONS MAY CHANGE; F	REFER TO C	URRENT ELEVATION TABLE					



Page 3 of 6

PROJECT NAME: HOOKER/RUCO SITE

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-81

DATE COMPLETED: November 2, 2005 DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

FIELD PERSONNEL: S.DALY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST		· · · · · ·	SAMF		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
- 185								
- 190	- tan brown at 189.0ft BGS		CEMENT/ BENTONITE GROUT		यस स			
195				11	ब.ब.ब. ब.ब.ब.			26.
205			CEMENT BENTONITE GROUT 2°0 SCH 40 BLACK IRON RISER 2°0 SCH 80 PVC RISER		સંસ્થાન સંસ્થાન			
210	SAND, some silt, fine to medium grained sand, orange brown	-87.40	BLACKIRON RISER 2'0 SCH 80 PVC RISER		ज्या व			
215				12	र्यसम्			4.5
220			2°0 SCH 80 PVC RISER	-	.स.स.स			
230	SILTY SAND, fine grained sand, tan brown, orange	-107.40	PVC RISER		4 4	-		
235	and light gray mottles				र स्थान			20
240	· ·			13	<u>। स्थान</u>			20
245	SILTY CLAY, stiff, dark gray	-124.40		ļ	स्य स			3.8
250		-133.40			144			9.3
255	SAND AND SILT, trace clay, fine grained sand, light gray and light brown, sweet odor	-100.40		14	स्य य			
265								17.2
		-147.40						



Page 4 of 6

PROJECT NAME: HOOKER/RUCO SITE

HOLE DÉSIGNATION: MW-81

PROJECT NUMBER: 6883

DATE COMPLETED: November 2, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL NEST	~	1 .	SAMP		
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(سوم) حاط
	SAND, fine to medium grained sand, tan brown and light gray, orange mottles, sweet odor	-						
-275			GROUT	15	संस्थान संस्थान			8.
-280	• •			15	स.स. स.स.			Q.
-285					संस्था संस्थान			
-290	SAND, trace silt, medium grained sand, light gray, sweet odor	-167.40			44.			
295			BENTONITE CHIP SEAL	16	2 4 4			5.
-300	 mixed light gray and tan brown, some fine grained sand, sweet odor at 300.0ft BGS 				<u> </u>			
-305			#1 SILICA SAND		1 1			
-310			SAND MW-81D1 SCH 80 PVC WELL SCREEN	17	2 4		•	25
-315			SCREEN		4 4 4			
-320	SILTY SAND, some clay, fine grained sand, light gray, sweer odor	-197.40			1 1 1			
-325	•							10
-330				18	संस			
-335	SAND, trace silt, medium grained sand, light gray	-212.40						34
340	- slight sweet odor at 339.0ft BGS		2"0 SCH 40 BLACK IRON RISER					
345				į	સ્ત્રસ્ત્રસ્ત્રસ્ત્ર સ્ત્રસ્ત્રસ્ત્રસ્ત્			14.
350	 with silt, medium to fine grained sand, gray and dark gray at 350.0ft BGS 			19	.स.स.स.स. स.स.स.स.स.	-		
355		-236.40	BENTONITE		1 11			7.8
	SAND AND SILT, fine sand, gray		BENTONITE CHIP SEAL		4 4			6.5



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: November 2, 2005 DRILLING METHOD: 6" ID ROTASONIC

MW-81

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

HOLE DESIGNATION:

FIELD PERSONNEL: S.DALY LOCATION: HICKSVILLE, NY ELEV. SAMPLE DEPTH ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS MONITORING WELL NEST ft BGS (mdd) INTERVAL REC (%) 뎶 - fine to medium grained sand, light gray at 360.0ft 365 20 10.8 -370 -251.40 SAND, firm, fine grained sand, light gray 1.6 -375 - loose at 375.0ft BGS -380 -385 21 12.7 -390 - lens of clay, with silt from 395.0 to 397.0ft BGS 395 -278.40 400 SAND, some silt, fine medium grained sand, light gray, no odor -- 405 #1 SILICA SAND 16.6 MW-81D2 -410 STAINLESS STEEL WELL SCREEN -415 with slit, medium grained sand, light tan, dark gray sity mottles at 417.0ft BGS 420 425 23 16.8 430 CRA CORP.GDT BENTONITE CHIP SEAL -435 - some silt, fine to medium grained sand, reddish brown at 438.0ft BGS 440 - silty day lens, light brown, no odor from 442.0 to 444.0ft BGS 2.2 445

6883.GPJ OVERBURDEN LOG

NOTES:

MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



Page 6 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-81

DATE COMPLETED: November 2, 2005 DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S.DALY

LOCATION: HICKSVILLE, NY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM		
11 503		AMSL		BER	RVA	REC (%)) A	mdd
				NUMBER	INTERVAL	Ж	'N' VALUE	PID (ppm)
	END OF BOREHOLE @ 450.0ft BGS	-328.40	WELL DETAILS		_			
-	- .		Screened interval:					
455			-183.40 to -193.40ft AMSL 305.00 to 315.00ft BGS					
			Length: 10ft					
- -460			Diameter: 2in Slot Size: 10					
			Material: SCH 80 PVC					
-465			Seat: -165.40 to -178.40ft AMSL					
: 703	•		287.00 to 300.00ft BGS					
:			Material: BENTONITE CHIPS Sand Pack:					
-470			-178.40 to -197.40ft AMSL					
			300.00 to 319.00ft BGS Material: #1 SILICA SAND					
-475			l ———					
			Screened Interval: -283.40 to -293.40ft AMSL					
-480			405.00 to 415.00ft BG\$ Length: 10ft					
:		:	Diameter: 2in					
485		ŀ	Slot Size: 10 Material: STAINLESS STEEL					
: [Seal:				1	
490			-197.40 to -275.40ft AMSL 319.00 to 397.00ft BGS					
			Material: BENTONITE CHIPS					
-495			Sand Pack: -275.40 to -294.40ft AMSL					
: "			397.00 to 416.00ft BGS Material: #1 SILICA SAND					
-500			Materias. #1 SILICA SAIND					
300		İ						
-505	-							
-505			·				ļ	
-510								
-515								
-520								
				1				
-525								
.						1		
-530								
		1		- 1				
-535								
				1	ľ			
NOT	ES: MEASURING POINT ELEVATIONS MAY CHANGE; I	REFER TO C	CURRENT ELEVATION TABLE					



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-82

DATE COMPLETED: February 15, 2006

DRILLING METHOD: 6" ID ROTASONIC

ft BGS		AMSL	<u>i</u>		1 4	1 ~		
1	GROUND SURFACE	120.50		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (nom)
-	SAND AND GRAVEL, loose, medium to coarse,		CONCRETE		1			
	orange-brown			1	4 4			0.0
-5				'				J.,
-								
-10			MW-82D1 TOP OF CASING 120.14 R					İ
:			TOP OF CASING					
:			120.14 ft AMSL					İ
-15								
			NW 92D2	2	4 4			0.3
-20			MW-82D2 TOP OF		4			
:			MW-82D2 TOP OF CASING 120.15 ft AMSL					
25			MW-82D2 TOP OF CASING 120.15 ft AMSL	ŀ	<u> </u>			
: L		92,50		1				
-30	SAND, some gravel, loose, medium to coarse grained sand, tan brown							
	granted data, tan storm			İ			ı	
: ,,			CEMENT/BEN	TONITI				
-35 -			GROUT		4 4			0.0
-				3	4 4		.	
-40	- medium grained sand, red brown at 40.0ft BGS				4 4			
:	flow flow to modify a grained good too brown at		CEMENT/BEN GROUT 2º 0 SCH 80 PVC RISER 2º 0 SCH 40 BLACK IRON RISER		<u> </u>			0.2
-45	- firm, fine to medium grained sand, tan brown at 44.0ft BGS		2" 0 SCH 80 PVC RISER		12 12		ľ	
:	- loose, medium grained sand at 48.0ft BGS			1				0.0
- -50	,						1	
				:				
-5 5			2" 0 SCH 40		4 4			
			BLACK IRON RISER		4		ı	
				4	4 4	- 1		0.1
-60	alou lana from 62.0 in 62.08 BCS					ł		
	- clay lens from 62.0 to 63.0ft BGS					j	I	
-65					4 4			
:			2" Ø SCH 40 BLACK IRON RISER		1	I		
-70			YAYAYA I		اما اند		ļ	0
:								Ů
75	SILTY CLAY, firm, light gray	46.50						a
-	SAND, loose, medium grained, tan gray	44.50			4 4			
00				5				
-80				ŀ				0
	-	1		ļ				J
-85				ŀ				
	- light gray at 88.0ft BGS							
NOT					1 14			



OVERBURDEN LOG

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

MW-82 HOLE DESIGNATION:

DATE COMPLETED: February 15, 2006 DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S.DALY

LOCATION: HICKSVILLE, NY

ELEV. SAMPLE **DEPTH** MONITORING WELL NEST ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS ft BGS N' VALUE PID (ppm) INTERVAL REC (%) NUMBER 95 0.0 100 105 - tan brown and light gray at 108.0ft BGS 110 -115 0.3 120 125 - light gray at 128.0ft BGS 130 135 n 140 - orange brown at 144.0ft BGS - 145 0 - fine to medium grained sand, light gray at 148.0ft - 150 <u>- 155</u> 0.0 -160 -165 6883.GPJ CRA <u>⊢170</u> 0.6 -175 MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:



Page 3 of 6

PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: MW-82 DATE COMPLETED: February 15, 2006

PROJECT NUMBER: 6883

DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC. LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	<u> </u>	Π.	SAME		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (mon)
	SILTY SAND, firm, fine to medium grained sand, tan brown	-59.50			4 4			0
- 185	SILTY CLAY, stiff, dark gray	-65.50						0
190					2 4 4			
- 195				11	.च.च.च.च.च.च.च			o
200					4 4			
205	SAND AND SILT, firm, fine to medium grained sand, tan brown and light gray	-84.50 -87.50			4 4			0
210	SILTY CLAY, stiff, dark gray		← CEMENT/BEN GROUT	TONIT				0
-215	SAND AND SILT, firm, fine to medium grained sand, tan brown and light gray	-92.50		12	1 4			
-220			27 0 SCH 80 PVC RISER	12				O
225	CLAY AND SILT, stiff, light gray	-104.50						a
-230	SILT AND SAND, firm, fine grained sand, tan brown, sweet odor	-107.50	2" 0 SCH 40 BLACK IRON BISER					
-235								0.
-240	SILTY CLAY, firm, dark gray	-117.50		13	4 4 4			
-245			CEMENT/BEN GROUT 2º 0 SCH 80 PVC RISER 2º 0 SCH 40 BLACK IRON RISER					0.0
-250	SAND, loose, medium grained, tan brown, no odor	-127.50			4 4 4 4 4			
-255	•							0.
-260				14				,
-265								
!	fine to medium grained sand, tan brown, some orange brown and light gray mottles, no odor at TES: MEASURING POINT ELEVATIONS MAY CHANGE; i				4 4			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: February 15, 2006
DRILLING METHOD: 6" ID ROTASONIC

HOLE DESIGNATION: MW-82

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST		,	SAM	PLE	
BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	AMSL	monto o marco	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (non)
	268.0ft BGS				1 1			
275				15	सम्ब			1.
280			CEMENT/BEI	TONIT				
285	- medlum grained sand, tan brown at 288.0ft BGS		CEMENT/BEI GROUT 2º 0 SCH 80 PVC RISER 2º 0 SCH 40 BLACK RON RISER BENTONITE CHIPS		<u>૽ૺ૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽૽</u>			
290	•		2" 0 SCH 80 PVC RISER	16	સારા સ			c
295	SILTY CLAY, firm, light gray	-175.50						c
300	SAND, loose, fine to medium grained sand, tan brown and reddish brown, sweet odor	-179.50	2" Ø SCH 40 BLACK RON RISER BENTONITE CHIPS		4			
305					1			6.
310	•				2.4.4			
315	- light gray and tan brown at 317.0ft BGS							
320					संच्या संच्या			11
325				17	ના તાડ સંસ્થાર			
330								7.
335	SILTY CLAY, stiff, dark gray	-213.50	BENTONITE		<u>सस्य</u>			C
340	SAND, loose, fine to medium grained, orange brown	-217.00						
345			SAND PACK		તાં સાંસ્થાર સાંચ્યા ચારા ર			7.
350	 medium grained sand, gray and olive-brown to tan brown, sweet odor at 350.0ft BGS 		MW-82-D1 SCH 80 PVC WELL SCREEN					
155			I III III		यस्य स्ट यस्य स्ट			15



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-82

DATE COMPLETED: February 15, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			T	PLE	
R BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
365	SAND AND SILT, loose, fine to medium grained sand, tan brown and light gray, sweet odor	-246.50						
375	4 A A A A A A A A A A A A A A A A A A A			18	4444			11.
380	- tan brown and red-gray at 378.0ft BGS	٠	BENTONITE		444			48.
385	- clay lens from 385.0 to 388.0ft BGS	-268.50			1144			
390	SAND, loose, medium to coarse grained, reddlsh brown, sweet odor	255.00	2" Ø SCH 40 BLACK IRON RISER		.स.स.स स्थापन			41.
395			2° 8 SCH 40 BLACK IRON RISER		4			
400								
410	- clay lens from 408.0 to 412.0ft BGS		■ sand pack					43.
415			SAND PACK MW-82-D2 STAINLESS STELL WELL SCREEN					
420	 medium grained, red brown to light pink, no odor at 420.0ft BGS 		B		4 4 4			
425				19	4 4 4			
430			BENTONITE					4
435			CHIPS		च त त			
445				j	यं व व व व व व व व व व व व			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-82

DATE COMPLETED: February 15, 2006

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAMI		
BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
455 460 465 470	END OF BOREHOLE @ 450.0ft BGS	-329.50	WELL DETAILS Screened Interval: -184.50 to -194.50ft AMSL 305.00 to 315.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: SCH 80 PVC Seal: -169.50 to -179.50ft AMSL 290.00 to 300.00ft BGS Material: BENTONITE CHIPS Sand Pack:					
175			-179.50 to -199.50ft AMSL 300.00 to 320.00ft BGS Material: #1 SILICA SAND					
480 485			Screened interval: -284.50 to -294.50ft AMSL 405.00 to 415.00ft BGS Length: 10ft Diameter: 2ln Slot Size: 10 Material: STAINLESS STEEL					
190			Seal: -269.50 to -279.50ft AMSL. 390.00 to 400.00ft BGS Material: BENTONITE CHIPS					
195			Sand Pack: -279.50 to -299.50ft AMSL 400.00 to 420.00ft BGS Material: #1 SILICA SAND					
500								
510								
515								
520	·							
525								
525 530 535 NO	•							



Page 1 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-83

DATE COMPLETED: October 7, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST		T	ī	LE	
ft BGS	GROUND SURFACE	121.58		NUMBER	NTERVAL	REC (%)	N' VALUE	
1				ž	1	~~	Ż	
	SILTY SAND, trace gravel, light brown, no odor		← CONCRETE	01	य य य			0
-5			MW-83D1 TOP OF	,	11 14			
	SAND AND GRAVEL, medium to coarse sand, fine gravel, dry, light brown and red brown, no odor	115.58	MW-83D1 TOP OF CASING		2 2			
-10	graves, dry, light brown and red brown, no odor		CASING 120,99 ft AMSL	02	11 11			0
			MW-83D2		सस्य			
-15	W. W. Land Hebbberry	105.58	TOP OF CASING					
ŀ	SAND, trace silt, medium grained sand, light brown, moist, no odor		121.02 ft AMSL	:	4			
-20			CEMENT/	03	ત્રાના સામાના ક ત્રાના સામાના ક			0
26			CEMENT/ BENTONITE GROUT		1			
-25	- trace gravel at 26.0ft BGS		BENTONITE GROUT		4 4			
-30			2" @ SCH 80 PVC RISER	04	1			1
					4 4			
-35	OLEV Asses silk stiff dock brown	85.58						
	CLAY, trace slit, stiff, dark brown				4			
-40				05	्वस्य अस्य स्टब्स्स्य स्टब्स् जनसङ्ख्याचाराचाराच्या			0
-45			2" 0 SCH 80		نما الما			
-43	SAND, fine grained, light brown, moist, no odor	75.58	PVC RISER		4.4			
-50			2*0 SCH 80 PVC RISER	06	4.4.4.4			0
					0 0			
-55	CLAY, high plasticity, dark gray, wet, no odor	65.58			स्थानस्य			
	OLAT, mgr plasticity, dain gray, not, no occ.				1			0
-60	SAND, medium grained, tan brown, moist, no odor	60.58		07	1 1			٥
-65					3d 3d			٠
	- fine to medium grained sand, wet at 66.0ft BGS				स्यास स्यास			
-70				08	4 4			0
					4 4			
-70 -75 -80	- light gray, clean, saturated at 76.0ft BGS							
- 80								0
30				09	444			J
-85					扫扫	}		
		i			1 1			
NC.	TES: MEASURING POINT ELEVATIONS MAY CHANGE; RE	FER TO	CURRENT ELEVATION TABLE		<u> </u>	1		



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PROJECT NAME: HOOKER/RUCO SITE

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

HOLE DESIGNATION: MW-83

PROJECT NUMBER: 6883

DATE COMPLETED: October 7, 2005

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	_	T	IPLE
ft BGS		AMSL		NUMBER	INTERVAL REC (%)	'N' VALUE
-95 -100	- gray at 96.0ft BGS		CEMENT/ BENTONITE GROUT 2º 0 SCH 80 PVC RISER 2º 0 SCH 80 PVC RISER	10	444444	
-105	- trace coarse sand, gray and brown at 106.0ft BGS		CEMENT/ BENTONITE GROUT 2' 0 SCH 80 PVC RISER			
-110	- clay lens from 112.0 to 114.0ft BGS	ļ		12		
-115	- light brown, saturated at 116.0ft BGS					
-120 -125	modium grained and light hours and arongish		2 0 SCH 80 PVC RISER	13	च च च च	C
-130	 medium grained sand, light brown and orangish brown at 126.0ft BGS 			14	य अ.स.च संस्थान	d
- 135	CLAY, stiff, dark gray, no odor	-14.42	2° 0 SCH 80 PVC RISER		4 4 4 4	
-145	- trace silt at 146.0ft BGS		PVC RISER	15		O
- 150				16	4444	o
-155	SAND, loose, fine to medium grained, light gray and orangish brown, no odor	-34.42			4 4 4	o
- 165	- light brown and light gray at 166.0ft BGS				रस्यस्य	
-170				18	<u>स्वच्यत्</u>	0.
175					4 4 4	



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-83

DATE COMPLETED: October 7, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	THE THE PERSON OF THE PERSON O	ELEV.	MONITORING WELL NEST		,	SAMP		
ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	AMSL	MONITORNIO VILLE NEEL	NUMBER	INTERVAL	REC (%)	'N' VALUÉ	PID (pom)
				19	4 4			0.0
-185	- slight sweet odor at 186.0ft BGS				सःसः चरव सःसः चरव	1		
-190			CEMENT/ BENTONITE GROUT	20	ન.ન.સ.સ.સ. અ.સ.સ.સ.સ.સ			3.3
-195	- ilght brown, sweet odor at 196.0ft BGS				य स्थाप			
200				21	<u>स्थासस्य स्</u>	- 1		0.
-205	 light gray and orangish brown, thin clay lenses, no odor at 208.0ft BGS 		2" 0 SCH 80 PVC RISER		1 1		,	
-210	· -			22	संस्थ			0.4
-215	- loose, orange brown at 216.0ft BGS		70 504 00					
-220			2° 0 SCH 80 PVC RISER	23				O.
-225	- trace day at 226.0ft BGS	100.10		•	4 4			0.
-230 -	SILTY CLAY, light brown and gray	-108.42			य स्थान			0.
-235	- light gray at 236.0ft BGS			24	3.3.3 3.3.3	1		
-240								0.1
-2 45 -250	SAND, trace silt and clay, stiff, fine to medium grained sand, low plasticity, slight sweet odor, light gray orangish brown	-124.42			17 17			
-255				25	<u> </u>			0.0
-260					स्य			
-265	- tan brown, sweet odor at 266.0ft BGS							



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883 CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-83

DATE COMPLETED: October 7, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	-	1	SAMP		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (man)
-275			CEMENT/ BENTONITE GROUT		<u> अस्तर्भक्तस्य स्ट</u>			4.
-	CLAY, light gray, no odor	-155.42	BENTONITE GROUT	26	4 4		ŀ	0.0
280	SAND, fine grained, light brown, orange mottles, no odor	-158.42			31475 31475			0.9
-285	- medium grained sand, light brown, sweet odor at 286.0ft BGS				<u> </u>			
-290				27	સસસ			0.
-295			BENTONITE CHIP SEAL		सस्य			
-300	- loose, gray at 300.0ft BGS				444			
-305				28				3.
-310			MW-83D1 WELL SCREEN SAND PACK		1.41.4			
-315	- tan brown, slight odor at 316.0ft BGS		SAND PACK		4 2			
-320								
-325				29	1 4			0.:
-330			2° 8 SCH 80 PVC RISER		44,			
-335	 fine to medium grained sand, trace clay and silt, brownish gray, no odor at 336.0ft BGS 		2" 6 SCH 80 PVC RISER		સંસંધાયાના ના અંચાયાના ના ના ના ના ના ના ના ના ના ના ના ના			
-340								3.
-345			BENTONITE CHIP SEAL					
-350	- loose, medium sand, gray, slight odor at 350.0ft BGS		BENTONITE	31				14.
-355	OLAN keep and and all aliff fire arrived and	-235.42	BENTONITE CHIP SEAL	~'				
	CLAY, trace sand and silt, stiff, fine grained sand, dark gray CTES; MEASURING POINT ELEVATIONS MAY CHANGE; I							



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

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MW-83

(1,0020) 1101112111 11111

DATE COMPLETED: October 7, 2005
DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC. LOCATION: HICKSVILLE, NY

FIELD PERSONNEL: S.DALY

HOLE DESIGNATION:

ELEV. SAMPLE **DEPTH** MONITORING WELL NEST STRATIGRAPHIC DESCRIPTION & REMARKS ft AMSL 'N' VALUE PID (ppm) ft BGS INTERVAL NUMBER શ REC (संस्थान, संस्यान, संस्थान, संस 0.0 CEMENT/ BENTONITE GROUT 365 -244.42 SAND, loose, medium grained, tan brown 5.5 -248.42-370 CLAYEY SAND, trace silt, firm, light gray 0.5 375 33 -256.42 0.0 380 SAND AND SILT, fine grained sand, light gray - 385 - firm, sweet odor at 386.0ft BGS 390 SAND PACK 15.8 34 MW-83D2 395 WELL SCREEN 400 -279,42 SILTY CLAY, firm, light gray 0.0 405 -284.42 SAND, fine to medium grained, light brown and light gray -410 0.3 415 - loose, medium grained, light brown, trace gray at 416.0ft BGS 420 15.8 425 - fine to medium grained, reddish brown, no odor at BENTONITE CHIP SEAL 36 425.0ft BGS - 430 14.7 CORP.GDT -435 ₹ 440 6883.GPJ 37 -445 - light brown and gray at 445.0ft BGS 991 0.0 OVERBURDEN MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:



Page 6 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-83
DATE COMPLETED: October 7, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAME	1 1	
ft BGS	STATISTACTIO DECOME TION & TERMINA	AMSL		NUMBER	NTERVAL	REC (%)	'N' VALUE	PID (nom)
- 455 - 460 - 465 - 470 - 475 - 480 - 485 - 490 - 495 - 500 - 505 - 510 - 515 - 520 - 525 - 530 - 535	END OF BOREHOLE @ 450.0ft BGS	-328.42	WELL DETAILS Screened interval: -183.42 to -193.42ft AMSL 305.00 to 315.00ft BGS Length: 10ft Diameter: 2In Slot Size: 10 Material: SCH 80 PVC Seal: -172.42 to -178.42ft AMSL 294.00 to 300.00ft BGS Material: BENTONITE CHIPS Sand Pack: -178.42 to -199.42ft AMSL 300.00 to 321.00ft BGS Material: #1 SILICA SAND Screened interval: -268.42 to -278.42ft AMSL 390.00 to 400.00ft BGS Length: 10ft Diameter: 2In Slot Size: 10 Material: SCH 80 PVC Seal: -199.42 to -263.42ft AMSL 321.00 to 385.00ft BGS Material: BENTONITE CHIPS Sand Pack: -263.42 to -279.42ft AMSL 385.00 to 401.00ft BGS Material: #1 SILICA SAND	Z	<u>z</u>		N.	
- 525 - 530 - 535 NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO	CURRENT ELEVATION TABLE					



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-84 DATE COMPLETED: May 2, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH ft BG\$	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST		· · ·	SAM	
IL BGS	GROUND SURFACE	AMSL 121.34		NUMBER	INTERVAL	REC (%)	'N' VALUE
1	·			Ž	N N	8	ż
	TOPSOIL	121.17	CONCRETE				
	SAND AND GRAVEL, some silt, loose, fine to medium grained sand, orange-brown, no odor						
-5	indulan granisa dana, orango arenn, no ees.		MW-84D1				
			TOP OF CASING				
-10			CASING 120.90 ft AMSL				
-15							
	,		CASING 120.94 ft				
-20			CASING 120.94 ft AMSL				
20			CEMENT/				
			BENTONITE GROUT				
25					i		
-	SAND AND SILT, trace clay, firm, fine grained, light	93.34	AMSL CEMENT/ BENTONITE GROUT 2°0 SCH 40 BLACK IRON RISER 2°0 SCH 80 PVC RISER				
30	gray and orange		2°0 SCH 40 BLACK IRON				
			RISER				
35							
	- loose, tan brown, no odor at 38.0ft BGS						
40	, .						
1			278 SCH 80				
45			2"0 SCH 80				
			PVC RISER	1			
50				Į			
30							
					ı		
55	•				ļ		
-	SAND, loose, medium grained, tan brown and	63.34		1	l		
60	grayish brown			1			
1]			
65	SILTY CLAY, stiff, light gray	56.34		ı	- [
	- dark gray at 67.0ft BGS		PVC RISER	- [
70			127 127 127				
		ľ					
75	1			1			1
	SAND, loose, medium grained, tan brown	45.34					
30	- fine to medium grained sand, light tan, no odor at 78.0ft BGS	}		-			
						-	
,		ļ					
35		İ					
		l		Ì	İ	-	
NO.	TES: MEASURING POINT ELEVATIONS MAY CHANGE; REF	ER TO C	URRENT ELEVATION TABLE		4_	L	
		· -					



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-84 DATE COMPLETED: May 2, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAME	LE	
ft BGS	STATISTATIO DESCRIPTION AND AND AND AND AND AND AND AND AND AN	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
# BGS	- medium grained sand, tan brown at 118.0ft BGS SiLTY CLAY, compact, dark gray, no odor - stiff at 138.0ft BGS SAND AND SILT, loose, fine to medium grained, light gray SAND, loose, fine to medium grained, tan brown		CEMENT/ BENTONITE GROUT 2'0 SCH 40 BLACK IRON RISER 2'0 SCH 80 PVC RISER	NUMBER	INTERVAL	REC (%)	N' VALUE	
-165 -170 -175								



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PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: MW-84

PROJECT NUMBER: 6883

DATE COMPLETED: May 2, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	<u> </u>		SAMI		
ft BGS		AMSL.		NUMBER	INTERVAL	REC (%)	'N' VALUE	
- 185								
- 190	CLAY, trace silt, light brown	-88.66	CEMENT/ BENTONITE GROUT					
- 195								
-200	SAND AND SILT, trace clay, firm, fine grained, light brown	-76.66						
- 205			2°0 SCH 40 BLACKIRON RISER					
-210	SAND, loose, fine to medium grained, light brown	-88,66	STATE OF THE PROPERTY OF THE P					
-215								
-220	- tan brown at 218.0ft BGS		2°8 SCH 80 PVC RISER					
-225								
-230		-108.66						
-235	SILTY CLAY, stiff, dark gray							
	- no odor at 238.0ft BGS	•						
-240								
245	SAND AND SILT, trace day, firm, fine grained sand, tan brown and light gray	-124.66						
-250								٠
255	SAND, loose, medium grained, tan brown, sweet	-136.66						
260	odor							
265								
	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	PEEEB TO C	LIBRENT ELEVATION TARLE					



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PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: MW-84

PROJECT NUMBER: 6883

DATE COMPLETED: May 2, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL NEST	OC.	اد	SAM		
		AivioL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
275			CEMENT/ BENTONITE GROUT					
280		1						
285	SAND AND SILT, firm, fine grained sand, light gray and orange, sweet odor	-163.66	CEMENT/ BENTONITE GROUT 2*0 SCH 40 BLACK IRON RISER BENTONITE CHIP SEAL					
290								
295	SAND, loose, fine grained, light gray, sweet odor	-173.66						
300	 trace silt, firm, fine to medium grained sand, light gray, sweet odor at 300.0ft BGS 							
305			2'0 SCH 40 BLACK IRON RISER					
310	·							
315	•	-196.66						
320	SAND AND SILT, firm, fine grained sand, gray, sweet odor	1190.00						
325								
330		242.55	BENTONITE CHIP SEAL					
335	SAND, loose, fine to medium grained, light gray, sweet odor - medium grained, tan brown, sweet odor at 338.0ft	212.66						
340	BGS							
345			#1 SILICA SAND MW-84D1					
350			MW-84D1 SCH 80 PVC WELL SCREEN					
355								
	NOTES: MEASURING POINT ELEVATIONS MAY CHANGE	REFER TO						



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-84 DATE COMPLETED: May 2, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH R BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL NEST	~		SAMI	г	
		AWSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
365 370	- clay lens from 363.0 to 364.0ft BGS - SAND AND SILT, trace clay, firm, fine grained sand, gray from 366.0 to 377.0ft BGS - no odor at 372.0ft BGS	-244.66	BENTONITE CHIP SEAL			-		
375 380	SAND, loose, medium grained, tan brown, sweet odor							
385 390	·							
395	·	s	MW-84D2 STAINLESS					
100	 fine to medium grained, light gray, no odor at 400.0ft BGS 		STEEL WELL SCREEN #1 SILICA SAND					
105			BENTONITE CHIPS					
110 115	END OF BOREHOLE @ 411.0ft BGS STRATIGRAPHY OF MW-84 FROM IW-18	-289.66	WELL DETAILS Screened interval: -223.66 to -233.66ft AMSL					
120			345.00 to 355.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10					
125			Material: SCH 80 PVC Seal: -204.46 to -214.26ft AMSL 325.80 to 335.60ft BGS Material: BENTONITE CHIPS					
35			Sand Pack: -214.26 to -236.66ft AMSL 335.60 to 358.00ft BGS Material: #1 SILICA SAND					
35			Screened interval: -269.26 to -279.26ft AMSL 390.60 to 400.60ft BGS					
45			Length: 10ft Diameter: 2in Slot Size: 10 Material: SCH 80 PVC Seal:					



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

HOLE DESIGNATION: MW-84

DATE COMPLETED: May 2, 2006

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

FIELD PERSONNEL: S.DALY

SAMPLE ELEV. DEPTH MONITORING WELL NEST ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS ft BGS NUMBER INTERVAL 'N' VALUE REC (%) -236.66 to -261.26ft AMSL 358.00 to 382.60ft BGS Material: BENTONITE CHIPS --455 Sand Pack: -261.26 to -283.66ft AMSL 382,60 to 405,00ft BGS -460 Material: #1 SILICA SAND -465 -470 -475 -480 -485 -490 -495 500 505 -510 515 OVERBURDEN LOG 6883.GPJ CRA_CORP.GDT 1/30/07 MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:

	CLIE	eri (Hocke Ruce Defluing Contractor Boart Long Defluing Contracto				DATE/ DRILL CRA :	ING ME SUPERV	OMPLE THOD TSOR	TRD _	1/21, Daly	/10			
EPTHS	TIGRAI TERVAI IN ft	re l	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLLUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	8 A M P L	S A M M P E L T I H		SPLC (REC	ENETR RECO T SPOO CORD N RECO	ATION ORD ON EL	OVS UES	S	S I A N M T P E L R	P / D F D I	C A H N E A M L Y C S A I S	F
R O M	A T	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO EQLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ë	N O G D	6"	6*	6"	6*	Ж	R	L	(ppm)	<u>ь</u> а	
0	•	37	tan brown med sand with coarse sand and									<u> </u>	0.0		<u> </u>
			gravel, some fine sand and silt, loose	<u> </u>	ļ		_			_		 			-
		-	111111111111111111111111111111111111111	\vdash					\vdash		<u> </u>	-	0.0		T
37		57	loose WATER AT 50'		 		 			T					
		 	10052 WATER AT 50'												
57		67	light gray medium sand, some fine sand and						_	ļ	<u> </u>	<u> </u>	0.0	 	╀
			5:14 loose	<u> </u>	<u> </u>		-	ļ	ļ	↓_	-	<u> </u>	 		╀
				┼	 	-	┼-	-	┢	+	╀	 	0.1	-	t
67	ļ	77	light brown to light gray medium sand	+	╁	+-	+-	+-	╁╌	╁┈	 	+	1	†	t
		+	10052	+	1	\top	\top	十	T	\top					
77	 —	87	light area median sand . some time sand t										0.0	_	+
	<u> </u>	\ s' /	light gray medium sound, some time soul +					ļ	<u> </u>	-	+-	↓ —	-	╂	╀
				4-	-	┿		+	╁	+-	╀	╁	+	╂╌	╫
				+-		+-	+-	+-	+	╁	+	+	0.0	+-	+
87		97	light gray medium soul, loose, clay lens	+	-	+	+-	+	+	+	+-	1	- C	+-	+
	-	-	at 95-46'	+-	\top	+	+-	1	1	1					
	NOTE AND	•	DEPTH OF BOREHOLE CAVING DEPTH OF FRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:				OIL THI			-	_			·	

			DRILLING CONTRACTOR DRILLER BURFACE ELEVATION WRATHER (AM) (P.M.)												
IN	TERVA	TGRAPHIC ERVALS ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S). (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS		S M P L	S A M M P E L T	SAMPLE DETAILS PENETRATION RECORD RELIF SPOON BLOWS (RECORD N-VALUES & RECOVERIES)						S I A N M T P E L R E V	P / I F I I	C A N E A L Y S I S A L S	G R A I N S I
R 0 M	A T	7 0	MOISTORE CONTENT, SUPPLEMENTATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	O D N O I H	6"	6"	6"	8"	N	R	E V	D (ppm)	L S	Z
7		117	Clau layers at 97-99', 124-1051										0.0		_
17		127	light gray medium sand, loose										O. v		
27		/37	tan Grown Fine Sand + Silt firm, thin Clay leases throughout			-							0.0		
37		150	light gray med sand, loose										0.0		
50		157	tan brown + light gray medium sand										0.1	-	上
51		171	light gray fine - medium sand, louse	-	-	-		-		-	-		0.2		F
71		187	light gray fine-medium sand, loose	-	 	-	-			-	-		0.1	-	Ŧ
82		187	fan brown + light gray fine sandt silt, some medium sand, from	1		1	-						0.0		Ŧ
	-	-													I
C	NOTE: AND OMMEN	_	DEPTH OF BOREHOLE CAWNG DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:					XNESS .					<u> </u>		

	PROI	ect kumi VT	DEILING CONTRACTOR DEILING CONTRACTOR DEILING CONTRACTOR SURFACE ELEVATION WEATHER (A.M.) (P.M.)				DATE, DATE, DRILL CRA	TIME S TIME (ING ME SUPERV	TARTE COMPLE THOD ISOR _	TED					G
EPTHS	TIGRAI TERVAI IN (t	<u> </u>	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE PHASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	S M M P E L T I H		SPLI (REC	SAMP PENETR RECO T SPOO CORD N RECOV	ATION ORD ON BL	OVS JES	3	S I A N M T P E L R	P / D F D I	HNEL	R I N S I
ROM	Å	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ē	N O G D	6*	6"	8"	6*	N	R	Å	(ppm)		2 E
87		191											0.0		 -
			fan brown + light gray tine sand + silt firm , some medium sand , clay layer at 193-195'			<u> </u>	<u> </u>	\sqcup							\vdash
					 	-	_				-	-	0.0		-
97		210	tan brown fine sand + silt, clay lenses, firm	-	 	╁─	-	-		-	\vdash		1		一
		-	the selection of the selection	-	-	╁	\vdash		-		-		0.0		Γ
2/0		214	dark gray black silty clay, stiff		1-	\dagger	†	\vdash			1				
2/4		2/7	tan brown fine soul + 5:1+, clay lenses, firm		1	1							6.1		Γ
21 7		211	Tan brown Tink som porter, they may have	T										<u> </u>	L
2/7		232	tan bown fine - medium rand, some sitt, loose						<u></u>	┞-	<u> </u>		0.3	 	╀
		† -				 	lacksquare		ļ	ــــ	<u> </u>	↓ —	-	 	╄
232		235	light gray clay, st. ff	_	.	-	-	┼	-	├	┼	+	011	1—	╁
			, , , , , , , , , , , , , , , , , , ,	├	↓ —	+-	+-	╁	┼-	+-	╁	+-	0,5	+	十
235	L_	237	tan brown fine sand & silk I firm	┼	+-	+	+	+	╁	+	1	+	1	†	十
<u> </u>	_	-	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	†-	+	+	+-	\top	T	1	T	T -	0.0		I
237	_	257	1	T	+-	\dagger	T	1	1	\top					I
257	-	12	from fan brown Fine sand + silt some clay lenses	1	1								0./	1_	\downarrow
-> (265	firm								\perp			Ц	上
c	NOTE: AND OMME	_	DEPTH OF BORBHOLE CAWING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY INDIES:					L			-				



	<u> </u>		- 85		TED	TARTE: OMPLE THOD	TIME 5	DATE/ DATE/				S HOO KEE RUC- DRILLING CONTRACTOR DRILLING SUBPLIER REVATION F. LICSVIIIE, 134 WEATHER (AM) (P.M.)	PROD	
G R I N S	C A H A L L C S A I L S	SAMPLE DETAILS PENETRATION S I RECORD A N F / SPLIT SPOON BLOWS P E D F (RECORD N-VALUES L R D F & RECOVERIES) E V D								S M M P E L T	S A M P L	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), RECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTERCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	1 1 1	
Z E	L S	(ppm)	L	R	N	6"	6"	6"	6"	IH NO GD	E #	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE RAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	A	
		0.1										light gray fine sand toilt itiem		265
		3.6										tan brown fine-mad sund, some sitt, loose slight sweet ador		177
		2.6				_						tan bearn fine-med sand + Filt, loose, oder	ļ 	287
		0.0										do-legray/black 5ilty clay, 5t. ft		289
	_	0.0										clark gray / black rilty cky, stiff		297
-	+-	3.3			-							tan brown troddish brown medium sand		309
		3.8					-			-		tan brown medium sand, box, ador	<u> </u>	317
+		4.5										light gray fine sand + silt, some Clay firm	+	323
	<u> </u>	6.8	<u> </u>	<u> </u>	<u></u>		XNESS					DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE	NOTE	330

	PROJE	KT NUME	I tooker Ruco Drilling Contractor BRILER SURFACE REVATION WEATHER (AM.) (P.M.)				HOLE DATE, DATE, DRILL CRA		83						
IN	PERVAL	TGRAPHIC ERVALS IN ft./m BGS SECONDARY COMPONENTS, RELATIVE DESCRIPTORS SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLDUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS			SAMPLE DETA S A PENETRATION RECORD A M M SPLIT SPOON BLOVS M P E (RECORD N-VALUES P L T & RECOVERIES)								p / I F I D	E A L S	G R A I N B I
R O M	A T	T	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	6"	6"		- 		R	H T P E L R E V	(ppm)	L S	Ż
337		348	fan brown treddich brown medium sand	-			<u> </u>		+				3.0		-
348		358	fan brown medium sand, loose, odar						+				6.6		
35.8		364	tan brown treddish brown medium sand, loose	-									2.8		
364		368	light gray fine sand + silt, firm , odor										3.4		
368		375	roddish brown medium sand, loose, odo-				_						6.0		上
375		398	light gray fine sand silt firm , odor		<u> </u>				_				7.6		1
398		407	light gray medium sand, loose odor										2.4	-	‡
	407		END OF BORING	1								_		-	
	_					+				<u> </u>				<u> </u>	土
c	NOTES AND OLOGEN		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVER' NOTES:												



PROJECT NAME: Hooker Ruco	HOLE DESIGNATION: $MW-8S$ $(S+T)$ DATE COMPLETED: $/2/4/10$
PROJECT No: 6883	
CLIENT: GSHT	DRILLING METHOD: Son. C
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5. Daly
	ROAD BOX
643	GROUND SURFACE
- M-	
	CONCRETE COLLAR
[<u></u>	
	SAND / GRAVEL

, a	GROUT TYPE: Portland coment / bentonite
No.	
	BOREHOLE Ø: 6 In
[3] [4]	
Í	MONITORING WELL Ø:in
(A)	
	MONITORING WELL Ø: 2 in
TOD OF DEAL AT. 2.08 A	
TOP OF SEAL AT: 208 ft F BOTTOM OF SEAL AT: 2/3 ft	SEAL TYPE: bentonite Chips
TOP OF SCREEN AT: 218 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 228 ft	SCREEN: Ø: Z in SLOT SIZE: 10
TOP OF SEAL AT: 233 ft	
	SEAL TYPE: ben fonte chips
Dip sea	SEAL TYPE: OCATION (MIPS
BOTTOM OF SEAL AT: 273 ft	
TOP OF SCREEN AT: 277 ft	PACK TYPE: SAND, SIZE #0
i i i i i i i i i i i i i i i i i i i	SCREEN: Ø: 2 in SLOT SIZE: 10
BOTTOM OF SCREEN AT: 287 ft	
TOP OF SEAL AT:	SEAL TYPE:
	BOTTOM OF HOLE AT: 287 ft
SCREEN TYPE: X Continuous Slot F	Perforated Louvre Other:
SCREEN MATERIAL: X Stainless Steel	PVC Other:
HOLE DIAMETER: 6" + 287' 7" +	228' in 5 7 5+I
DEVELOPMENT: METHOD: A.V. F.+	228' in 5+I DURATION: 4h15 + 2.5h15 (150 gals eq

PROJECT No: 6883 CLIENT: GS HF LOCATION: Hicksvill, NY	DATE COMPLETED: 12/2/10 DRILLING METHOD: Sonic CRA SUPERVISOR: S. Daly
TOP OF SEAL AT: 340 ft	GROUND SURFACE CONCRETE COLLAR SAND / GRAVEL GROUT TYPE: Portland Comput bentante GROUT TYPE: Portland Comput bentante BOREHOLE Ø:
SCREEN TYPE: Continuous Slot Perforated SCREEN MATERIAL: Stainless Steel P HOLE DIAMETER: 6" + 40.7 7" + 350 DEVELOPMENT: METHOD: Aicliff	PVC Other:

	PROJ	dect num Not	STRATIGRAPHY LOG (OVE BRILING CONTRACTOR BOST + Lance BRILING CO	you		I)	DATE DATE DRIL	DESIGNATION DE L'ATTEME L'ATTEME L'ATTEME L'ATTEME ME SUPER	STARTI COMPL ETHOD		11/8 11/4	110	1 or Ww	<u>5</u> -66)
1 11	ATIGRAJ NTERVA	T 00	SAMPLE DESCRIPTION					SAME	_ '					C A	G
P R O	A T	/m BGS	SECONDARY COMPONENTS, RELATIVE DEBISIT/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SHIPPLEMENTAW, RESPUBLING.	8 A M P L	S M M E L T L H		SPL (RE	PENET. REC T SPO CORD : RECO	ORD ON BI N-VAL	OWB Sau		S I A N T P E L R	P / D P I D	H N E A M L I Y C S A I L S	R I N S I
O	T	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	8"	6"	6*	N	R	Ā	(ppm)	r s	Z
-		37	tan brown medium- coarse sand + gravel										0.0		
		 	some fine sand + silt, loose												
37		57	tan brown fine-modern Sand+sitt, firm			_				├					
				_						-			0.0		
57		77	tan brown med stind, some fine sandesilt loose										0.0		
77		92	tan brown medium-coarse sand loose										0.0		
92		97	tan brown + light gray fine sare, firm										0.0		
1													0. 5		\vdash
97		117	tan brown + light gray fine sand + silt firm thin-clay lenses										0.0		
1										-			 		
117		137	light gray time sand, loose										0.0		
137		154	light gray med soni, louse										0,2		
157		,,	• /						_				-14-	 	
h > 1		165	DEPTH OF BOREHOLE CXVNG DEPTH OF FIRST GROUNDWATER ENCOUNTER										0.3	<u> </u>	
	NOTES		DEPTH OF BOREHOLE CXVMG DEPTH OF FIRST CROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:		_	TOPSOIL	THICK	NESS _							
CO	AND LOCENTS	3	NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LEI NOTES:	igth, a	ND SAM	PLE INT	ERVAL	· _		 -					

		STRATIGRAPHY LOG (OVE			I)						PAGE	<u>Z</u> or	<u>\$</u> _	
PROJ PROJ CLIES LOCA	ECT NAME OF LOOK LINE OF LOOK L	7. (CSL). [4, A) V WEATHER (A.M.) (P.M.)				DATE DATE DRILL	/TIME /TIME LING M	STARTE COMPLI ETHOD	00 500 4 50	(/4//4 (/8/ (/*	10	nw-	<i>66)</i> == ==	
		SAMPLE DESCRIPTION											C A	G
IN M	S ∕an BGS	ORDER OF DESCRIPTORS: SUBJECT: OF DESCRIPTORS: SUBJECT: OF DESCRIPTORS: SUBJECT: OF DESCRIPTORS: ORDER OF DESCRIPTORS: SUBJECT: OF DESCRIPTORS: SU	8	N N Y S			REC	ORD			S I A N M T	P /	HN	R A I N
		GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	P	LT	1	(RE	CORD	N-VALI	JES		PE	ρĒ	Ċ S	8
A T	T	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	N O G D	6"	6"	6"	8"	Ŋ	R	E V	1	LS	I Z E
	177	light gay + tan brown medium soul, louse										2.5		
		sweet alor												
	197	tan brown + light gray medium sand lows.						\vdash				1. 50		
		suestodo-										-		
	217	ton brown fine-medium squaltsilt, firm					-					0.2		
	237	ton brown medium Sand, loose, clay lenses	L				_				ļ	5.6		-
		at 224-230, sweet odor												
	247	tan brown fine sind toilt, clay leases, firm										4.4		
		Tweet ado-					_			<u> </u>	<u> </u>			
	261	tan brown +light gray fine-medium sand				-	<u> </u>				ļ	8. c		-
_		Tive today, louise												
	277	tan brown meling send with fire send & silt		-	┝		<u> </u>			-		1/2	_	 -
		10034					<u> </u>			 	 -	7.2_		
OTES					TOPSO	L THICK	NESS .							
	3	note: for each split—spoon sample, record blow counts, n—value, sample recovery le <u>notes</u> :	NGTH,	and san	PLE INT	ERVAL								
	LOCA TIGRATICE YALL A T	LICATION TIGRAPHIC TERVALS IN (t/m BGS A T 0 1777 197 237 247 247	PROJECT MANE Hock Russ PROJECT MURBER 6333 CLIENT GSHT LOCATION HILLENDILL, AIN SURFACE RELEVATION WASTER (A.M.) (P.M.) TURRAPHIC CERVAIS IN 11/10 BGS SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S). (NATURE OF DEPOSIT), SECONDARY COMPONENT, RELAVATION STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS A T ONTE: PLASTICTLY DEFERMENTION REQUIRES THE ADDITION OF MOISTURE IF THE NOTE: PLASTICTLY DEFERMENTATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED ON NOT). 177	PROJECT NAME Hock Face PROJECT NUMBER 6883 GRAPHE LOCATION HISTORY NAME LOCATION HISTORY NAME LOCATION HISTORY NAME LOCATION HISTORY NAME CREEK G 5444 LOCATION HISTORY NAME CREEK G 5444 LOCATION HISTORY NAME CREEK G 5837 CREEK G 5444 CREEK G 6444 CREEK G	PROJECT MAJE Hotel Foce PROJECT MUJERS 6533 DRILLING CONTRACTION BOOK LONG WELL DRILLING JS HA LOCATION HILLENIEL, NIV THERAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TERRAPHIC TO REDER OF DESCRIPTORS: RI HAYD BGS SOIL TYPE SYMBOLIS) - PRIMARY COMPONENTS), (NATURE OF DEPOSIT), A M M M M M M M M M M M M M M M	TITGRAPHIC (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE CALL (M.) THE STRIBULS) SOULT THE STRIBULS — PRUMEY COMPONENTS. (MATURE OF DEPOSIT). SECURDARY COMPONENTS. EXERTIVE DEBINITY CONGESTENCY. SECURDARY COMPONENTS. EXERTIVE DEBINITY CONGESTENCY. SECURDARY COMPONENTS. EXERTIVE DEBINITY (CONGESTENCY.) A T SOUTH CONTROL DEFINIFICATION OF MODERNICS.) A T TO THE PLASTICITY DEFINIFICATION SECURITORS. THE DESCRIPTIONS. THE TOO DET TO BOIL (MIDICATE THE ADDITION OF MOISTURE IF THE E NO O O' SMAPLE IN TOO DET TO BOIL (MIDICATE THE MOISTURE WAS ADDED OR NOT). THE TOO DET TO BOIL (MIDICATE THE MOISTURE WAS ADDED OR NOT). THE TOO DET TO BOIL (MIDICATE THE MOISTURE WAS ADDED OR NOT). THE TOO DET TO BOIL (MIDICATE THE MOISTURE WAS ADDED OR NOT). THE TOO DET TO BOIL (MIDICATE THE MODITION OF MOISTURE IF THE E NO O O' THE TOO DET TO BOIL (MIDICATE THE MODITION OF MOSTURE IF THE E NO O' THE TOO DET TO BOIL (MIDICATE STAND) (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET TO BOIL (MIDICATE IN TOO DET	DEBLIE STATE LOCATION HIS JUST SUBJECT RESPATON TRANSPORT RESPATON TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TREATER (AM) TO SAMPLE DESCRIPTION SECONDARY COMPONENTS, RELATIVE DEBRIST (COUNTRY) A M M M M M M M M M M M M M M M M M M	DRILLIAN DETAILS (S. J. J. J. J. J. J. J. J. J. J. J. J. J.	DIRECTION STAFF LOCATION IS SHAPE LOCATION IS SHAPE LOCATION IS SHAPE LOCATION IS SHAPE LOCATION IS SHAPE LOCATION IS SHAPE LOCATION IS SHAPE CORDER OF DESCRIPTORS SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), A TO SHAPE RECORDER OF DESCRIPTORS SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), A TO SHAPE SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), A TO SHAPE NOTE: PLASTICITY, GRADITON, STRUCTURE, COLUMN NOTE: PLASTICITY DEPISEMENTATION REQUIRES THE ADDITION OF MOISTURE IF THE RECORDANY AND PERMANY DESCRIPTORS A M P P PRIMARY SECONDARY, COMPONENTS, RELATIVE DEPOSITY, COMPONENTS, RELATIVE DESCRIPTORS SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), A M M M P P P PRIMARY AND PERMARY COMPONENTS THE ADDITION OF MOISTURE IF THE END OF PRIMARY DESCRIPTORS SECONDARY COMPONENTS, RELATIVE DESIGNATIVE WAS ADDED OR NOT). A TO SHAPE IS TOO DEF TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). A TO SHAPE IS TOO DEF TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). A TO SHAPE IS TOO DEF TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT). A TO SHAPE AND PRIMARY COMPONENTS AND PRIMARY COMPONENTS AND PRIMARY COMPONENTS AND PRIMARY COMPONENTS AND SHAPE FOR DEPOSITY. A TOP SOIL THOO SHAPE AND PRIMARY COMPONENTS AND SHAPE FOR DEPOSITY. A TOP SOIL THOO SHAPE RECORD BLOW COMPONENTS AND HE SHAPE FOR PRIMARY COMPONENTS AND PRIMARY COM	DRILLEY TO SUPPLY SUPPL	DEBLEM STATE OF THE CONTINUE STATE OF THE CO	DRILER DOUGH THE CONTROL OF SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DETAILS FIRST DESCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DETAILS FIRST DESCRIPTION SAMPLE DETAILS FOR SUPERIORS SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION SAMPLE DETAILS FOR CONTROL OF PRINTERS DESCRIPTION AT A M M M M M M M M M M M M M M M M M M	DRILLE OUT OF THE SUBSCRIPTION SAMPLE DESCRIPTION SAMPLE DESCRIPT	PROLICE HOUSEN 653 PROLIC



			SURFACE ELEVATION SURFACE (AM.) (P.M.)		_		DRIL CRA	ung M	THOD TSOR	<u> </u>	adly			<u> </u>	
73	ATIGRA TERVA B IN ft	LS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(8) — PRIMARY COMPONENT(8), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURES, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M	S A M M P E		1	PENETI RECO T SPO CORD 1	ATION		LS	S I A N M T P E L R	P /	C A I	
R O M	A T	T	MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P	PE LT IH NO	6"	B"	RECO	VERIES	N N	R	L R E V	P / D F D	r a r i c a	
277		283	fan brown fine sandtsilt W clay lenses	-	G D	-			-			L	(ppm) 0.0		
283		287	light gray Medium Sand, loose										0.2		<u> </u>
287		297	light gray precision Sand, loose										0.1		F
297		300	light gray medium sand, loose										0.0		-
300		307	dark gray / black 5ilty clay, very 51.8f										0.0		
307		327	light gray fine sand + silt firm										1.2		
327		343	light gray fine sand + silt, firm										23		
			clay lenses at 330-335												F
343		347	light gray medium sand, some time sand tsilt										1.2		<u> </u>
1	otes and		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNOWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LE			TOPSOL	THICK	NESS _							

	PRO.	JECT NU	THE HEART RUCE DRILING CONTRACTOR BOTH L THERE 6883 THE CONTRACTOR BOTH L SURFACE REPORTED WEATHER (AM.) (P.M.)	ing yea			DAT! DAT! DRIL	/TIME :/TIME LING 1	STARTI COMPLI ETHOD VISOR	ED _/	il/&/	/o	nur	<u>-66</u> ,)
STRATIGRAPHIC INTERVALS (DEPTHS IN 1/m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:		8	SAMPLE DETAILS PENETRATION S I								C A H N	G		
FR			SECONDARY COMPONENTS, RELATIVE DESITY/CONSISTENCY, GRAIN SIZE/FLASTICITY, GRADATION/STRUCTURE, COLOUR, WOISTURE CONTENT, SUPPLEMENTARY, DESCRIPTIONS	S M P L	A M M P E L T I H		SPL (RE	REC T SPC CORD	ORD ON HI N-VAL VERIES	OVE		ANTPE	P / D F	E A I Y C S	N S
M	Ť	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	6"	8.	6"	6*	N	R	Ä	D (ppm)	LS	2
2''		302	tan brown + light gray medium sand, loose	1		-				ļ. <u></u>	<u> </u>		3.4		
362		367	tan brown thight gray fine sand toilt	‡									0.7		
367		277													<u> </u>
		327	light gray fine sand, some medium sand + silt	+									8.5		
321		382	SAME)										5.5		
382		387	ten boom modium sant, losse										2.2		
387		391	tan brown medium sand, lacre										7.2		_
391		392	light gray Silty clay, stiff										0.0		_
92		395	tan brown medium sand, loose										3. 2_		
95		397	light gray fine sandes: It firm										1.0		_
		ĺ	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION, AFTER HOURS COMPLETION DETAILS:			TOPSOIL	THICK	NESS _			·				
		3	NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY (ENGTH, A	AND SAM	PLE INT	ERVAL.								



≎ #¤D	CLIE	NT	DRILLING CONTRACTOR BORT Le BER GEST DRILLING CONTRACTOR BORT Le DRILLING CONTRACTOR BORT Le SUPPLIES GET LE SUPPLIES REVATION WEATHER (AM) (P.M.) SAMPLE DESCRIPTION				DATE DRIL CRA	C/TIME LING M SUPER	COMPI DETHOD TVISOR	2TED _ 	11/4/1 11/81 12/2	۵			
T	TREVA		ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTIONS	S A M P L	S M M P E L T I H		SPLI (RE	PENET	RATIOI ORD ON BI N-VAI	LOWS	S	8 I A N M T P E L R	P / I P D F	C AN E A L Y S I S L S	G R A I N
Ň	Ť	408	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	N O G D	6"	6"	6"	6"	N	R	E V A L	(ppm)	LS	Z
97		408	tan brown medium sand loose										1.5		
8		418	light gay fine medium sand + silt lower	╁				 -			_		2.2		
8		428	light gray fine-podium squal 15:14, loose							_			6.5		
8		438	tan brown medium sant, loase							_			0.8		
38′		441	tan brown thight gray 5: Ity clay wil fine sand, firm										0.2		
11		450	light gray fine sand tilt, film										0.4		
_	450		END OF BORING	╄						ļ					
				1	-					-			-		-
\dashv															
				-		-									_
\dashv									_	-					
	NOTES AND MEMORITI		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LIVINGS.			TOPSOIL		NESS _		_					

PROJECT NAME: Hocker Ruco PROJECT No: 6883	TA 1 . 25
CLIENT: GSHI	DRILLING METHOD: Sanic
LOCATION: Hicksville, NY	CRA SUF ERVISOR. 7. Dary
	ROAD BOX
(4)	GROUND SURFACE
<u> </u>	A CONSTRUCTION OF THE CONTROL OF THE
	CONCRETE COLLAR
100 m	
	SAND / GRAVEL
	GROUT TYPE: Portland Coment/bentant
1	
3.00	BOREHOLE Ø:in
	MONITORING WELL Ø: in
14.	MONITORING WELL Ø: 2 in
	WONTOKING WELL D.
TOP OF SEAL AT: 190 ft 1 1 1 1 1 1 1 1 1	SEAL TYPE: Rentinite Chips
TOP OF SCREEN AT: 200 ft	
TOP OF SORLENAT.	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 2/0 ft	SCREEN: Ø: 2 In SLOT SIZE: /O
TOP OF SEAL AT: 2/5 ft	# (100.1 %) #
TOP OF SEALAT.	SEAL TYPE: Bentante Chips
版) 90 24	SEAL TYPE: Dentanta (Nips
BOTTOM OF SEAL AT: 345 ft	
TOP OF SCREEN AT: 350 ft	PACK TYPE: SAND, SIZE #0
	SCREEN: Ø: 2 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 360 ft_	
TOP OF SEAL AT: 365 ft	SEAL TYPE: <u>Benton te</u> BOTTOM OF HOLE AT: <u>450</u> ft
The second secon	BOTTOM OF HOLEA). 7>0
SCREEN TYPE: Continuous Slot Perfo	
201121111111111111111111111111111111111	PVC Other:
HOLE DIAMETER: 6" to 450' 7" to 2	40 in



Page 1 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: October 4, 2005

HOLE DESIGNATION: MW-87 DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL NEST	~		SAME	· 7	
-	GROUND SURFACE	121.05		NUMBER	NTERVAL	REC (%)	N' VALUE	
			11	 _ _	=		٢	<u> </u>
	SILTY SAND, trace gravel, light brown, no odor		CONCRETE					
_		116.05						l
5	SAND AND GRAVEL, trace silt, fine to medium grained sand, medium to coarse grained gravel, light	110.00	MW-87D1 TOP OF					i
	brown, dry, no odor		CASING 120.55 ft		7 7			ĺ
-10	- no silt medium to coarse grained sand, medium to		AMSL	01	444			ı
	very coarse grained gravel at 7.0ft BGS		MW-87D2	"	1 1			
-15			CASING 120.55 ft AMSL MW-87D2 TOP OF CASING					ĺ
1	- trace silt, orange-brown at 17.0ft BGS		CASING 120,55 ft		4 4			ĺ
-20			AMSL AMSL					ĺ
20			CEMENT/	02				
	CAND to all the result weather assigned and	97.05	BENTONITE GROUT					ĺ
-25	SAND, trace silt, trace gravel, medium grained sand, medium to very coarse gravel, light brown, dry, no		CEMENT/ BENTONITE GROUT					
	odor		MW-87D1 TOP OF CASING 120.55 ft AMSL MW-87D2 TOP OF CASING 120.55 ft AMSL CEMENT/ BENTONITE GROUT 2" Ø SCH 80 PVC RISER					
-30	 no silt, medium to coarse grained gravel, light brown and orangish brown at 27.0ft BGS 		2" Ø SCH 80 PVC RISER					
				03	3 3			
-35								
_	SAND AND SILT, fine grained, reddish brown,	84.05						
40	moist, no odor				4 4			
-40	- light gray clay lens from 38.0 to 39.0ft BGS			04				
			27.4 SCH 80					Į
45		74.05	2" 6 SCH 80 PVC RISER		9 3			
	SAND, fine to medium grained, light brown, gray	14.03						
-50	areas, moist, no odor					ļ		
l				0.5				
-55			2° © SCH 80 PVC RISER		4 4			
<u> </u>	CLAY, high plasticity, brownish gray and dark brown,	64.05		:				
60	moist				4 4			
60				06	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
-	SW - SAND, fine to medium grained, light brown,	58.05			4 4	ļ	i	
65	orange mottles, moist, no odor				7 7			
ì	- wet at 67.0ft BGS							
70				l.	כו כו			
		-		07				(
75								
	- medium grained, stratified, light brown and gray at					ı	ĺ	
	77.0ft BGS				च च च च			
80				08	4 4			(
[1				
85					4 4			
	- fine to medium grained, orangish brown, saturated							
ļ	at 87.0ft BGS				4 4			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: October 4, 2005

HOLE DESIGNATION: MW-87

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	<u> </u>	T	SAMI		
IL BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(mod) CIQ
				09	4 4			0.
-95	•							
95	- light gray at 97.0ft BGS				1 2			
100	• • •							
: "				10	4			٥.
105			CEMENT/					
	- medium to coarse grained, stratified, light gray and		BENTONITE GROUT]		
-110	light brown at 107.0ft BGS]		
				11				0.
115					1			
:					2 2	1		
-120			CEMENT/ BENTONITE GROUT 2º 8 SCH 80 PVC RISER	12	4.	1		0.
				12	4 2	1		U.
- 125	trace silt fine to modium around modium dark							
	 trace silt, fine to medium grained, medium dark brown at 127.0ft BGS 							
- 130				13				0.
-	CH - CLAY, stiff, dark gray, no odor	-11.95	2° 0 SCH 80 PVC RISER		4			
- 135			PVC RISER		(mg) o			
- -140					4			
140				14	4			0.
- 145			2° 0 SCH 80 PVC RISER					
	SC - CLAYEY SAND, light gray orange, no odor	-25.95						
-150	CO CENTER OF ALLS, ngmg.cs, or conger, no con				4			
				15				0.
- 155					4			
<u> </u>	SW - SAND, medium grained sand, gray and light	-35,95						
- 160	brown, no odor				524 P			0.0
				16	1			U.
- 165	to a stantified light house and appropriate as				4			
	 loose, stratified, light brown and gray layers, no odor at 167.0ft BGS 				4			
- 170				17				0.0
					4 4	-		
-175					ય ન સા સા ના ત	ĺ		
					1 1			
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO C	URRENT ELEVATION TABLE					



OVERBURDEN LOG 6883,GPJ CRA CORP.GDT 1/30/07

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-87

DATE COMPLETED: October 4, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	-	. 1	SAMP	—	
BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(man) (Jid
				18	4 4			0.0
185		-65.95						
Γ	light gray and orangish brown, thin clay lenses, no odor	50.50					1	
190	0001		CEMENT/ BENTONITE	19			1	0.0
I			GROUT	"	4	- 1		•
195		75.05			4 4			
	SW - SAND, fine to medium grained, stratified,	-75.95	GROUT 27 Ø SCH 80 PVC RISER		4			
200	orange brown and light gray, no odor						İ	0.0
ĺ				20			ł	0.0
205			2" Ø SCH 80 PVC RISER					
					4 4			
210							l	
ĺ								
215					4 4			
				21	4 4			0.0
220			2" 0 SCH 80 PVC RISER				Ì	
			D D D PONISEN			- 1		
225			CEMENT/ BENTONITE GROUT 2" Ø SCH 80 PVC RISER 2" Ø SCH 80 PVC RISER					
-		-105.95					l	
230	SM - SILTY SAND, trace clay, firm, tan brown, no odor	-109.95						0.0
	CH - CLAY, trace slit, stiff, dark gray				4 4		- 1	0.0
235		-114.95			444444444444			•
	SW - SAND, loose, fine to medium grained, orange	-114.55		22				0.0
240	brown	-119.95			ė ė			0,0
	SC - CLAYEY SILT AND SAND, light gray and	-119.95			4	ŀ		
245	orange, no odor							0.0
		-126.95						
250	SM - SAND AND SILT, loose, fine to medium grained sand, tan brown to light gray, orange mottles	120.00						
	granted series, tell month to high green, comes				4 4			
255	·				4 4			
				23	4 4			0.0
60				~	1 1 1			
					4 4			
		-143.95						
65	SC - SAND, some clay, fine grained sand, orange brown and light gray, sweet odor	1						0.1
	SW - SAND, fine to medium grained, light gray,	-146.95		[



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-87

DATE COMPLETED: October 4, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM	,	
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
	orange mottles, sweet odor				4 4			
-275		45	CEMENT/ BENTONITE GROUT	24				
200	CH - CLAY, stiff, dark gray, no odor	-156.95 -158.95		27	1	1		0
-280	SC - SAND, with clay, fine to medium grained sand, thin clay layers throughout, light gray, sweet odor		CEMENT/ BENTONITE GROUT					1
-285								1
290	SW - SAND, trace clay, fine to medium grained sand, light gray, orange mottles, sweet odor	-166.95	CEMENT/ BENTONITE GROUT BENTONITE CHIP SEAL		4 4			
-295			BENTONITE CHIP SEAL	25				5
-300	- medium to coarse grained sand, light brown, no odor at 300.0ft BGS							:
-305			SAND PACK					4
-310	 fine to medium grained sand, light gray and orange brown at 308.0ft BGS 		MW-84D1	26	4.			14
-315	•		WELL SCREEN		4 4			
-320								5.
-325	SC - CLAYEY SAND, soft, light gray and orangish brown	-203.95	2" 6 SCH 80 PVC RISER		1 1			
-330	DIOWII		2" 6 SCH 80 PVC RISER	27	1			1.
-335	SW - SAND, fine to medium grained sand, interbedded layers of dark and light gray sand	-213.95			1 1			1.
-340	 loose, medium grained sand, light brown, no odor at 338.0ft BGS 				1	•		0.
-345				28	444			U.
-350	- gray at 350.0ft BGS				44			
- 355				29				1.
	NTÉS: MEASURING POINT ELEVATIONS MAY CHANGE;	DECED TO (BENTONITE SUBREME ELEVATION TABLE		أماأما		1	



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-87

DATE COMPLETED: October 4, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	-	т.	SAMP		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (nom)
365	- trace silt and clay, light brown and gray at 362.0ft BGS	-246.95	CHIP SEAL CEMENT/ BENT ONITE GROUT					16.
370	SM - CLAYEY SAND AND SILT, fine grained sand, light and dark gray, no odor	-250,95			1			0.0
375	CLAY, stiff, dark gray, no odor	-200.33		30				
-380								Q.
-385 -390	SAND, trace clay, fine grained sand, light gray, no odor	-266.95			4 44 4			
395				31				0.
400]		
- 405			SAND PACK	32				5.
-410 -415			MW-84D2 WELL SCREEN					
-420	- trace silt, medium grained, tan and brown at 418.0ft BGS							
-425				33	1.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4			0.
-430	- trace clay and silt, fine grained, light gray at 430.0ft BGS		BENTONITE CHIP SEAL		1 2			0.:
-435 -440	 trace silt, loose, medium grained sand, tan and reddish brown at 438.0ft BGS 				1 1 1			
-435 -440 -445				34				G. 4
	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO C	CURRENT ELEVATION TABLE		4			



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-87

DATE COMPLETED: October 4, 2005

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM		
BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(maa) Old
				N N	N	REC	> 2) Cla
	END OF BOREHOLE @ 450.0ft BGS	-328,95	NELL DETAILS		_		-	
}			WELL DETAILS Screened interval:					
455			-185.95 to -195.95ft AMSL 307.00 to 317.00ft BGS					
			Length: 10ft Diameter: 2in					
460			Slot Size: 10					
			Material: SCH 80 PVC Seal:					
465			-172.95 to -177.95ft AMSL 294.00 to 299.00ft BGS					
			Material: BENTONITE CHIPS					
470			Sand Pack: -177.95 to -197.95ft AMSL					
			299.00 to 319.00ft BGS Material: #1 SILICA SAND					
175			Screened Interval:					
			-283,95 to -293,95ft AMSL					
480			405.00 to 415,00ft BGS Length: 10ft					
			Diameter: 2in Stot Size: 10		·			
185			Material: SCH 80 PVC Seal:					
190			-197.95 to -278.95ft AMSL					
190			319.00 to 400.00ft BGS Material: BENTONITE CHIPS					
495			Sand Pack: -278.95 to -294.95ft AMSL					
100			400.00 to 416.00ft BGS Material: #1 SILICA SAND	İ				
500			Indicates. IF I over on the					
			·					
505								
510	,							
ŀ								
515								
520								
25								
30		ļ						
35			•					
				İ			1	



Page 1 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-88
DATE COMPLETED: March 22, 2008

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL NEST	r		SAMI		7
	GROUND SURFACE	120.89		NUMBER	NTERVAL	REC (%)	N' VALUE	4
	SAND AND GRAVEL, trace sift, loose,		CONCRETE	 				
	medium-coarse, orange brown				4	1		
•			MW-88D1 TOP OF CASING 120.17 ft		4 4	1		_
			CASING 120,17 ft		4			0
0			AMSL		4 4			
5			MW-88D2 TOP OF CASING		4 4			
Ĭ	SAND AND GRAVEL, silty, loose, medium-coarse,	104.89		ŀ				
0	tan brown		AMSL	ŧ				
			CEMENT/ BENTONITE GROUT					
5		94.89	GROUT		1 1			
	SAND, loose, fine-medium sand, tan brown							
0			2°0 SCH 40 BLACK IRON RISER					C
_	- red brown at 33.0ft BGS							
5	SAND AND SILT, loose, fine-medium sand, tan	84.89	1000					
,	brown							
0								
5		74.89	270 SCH 80 PVC RISER		2 2			
	SAND, loose, fine-medium sand, tan brown	17.00	PVC RISER					
0	- light gray clay, stiff at 50.0ft BGS					ŀ		o
	- light gray medium sand, loose at 52.0ft BGS							
5	SAND, loose, medium sand, light gray	64.89			ય ચાલા વ			•
	OTHE, 10000, Interior Same, light Stay							
)								
5								
' 	SAND, loose, fine-medium sand, light gray	54.89						
,								0
İ					4 4			•
j		44.89						
	SAND AND SILT, loose, fine-medium sand, tan brown				4 4			
•					4 4		ļ	0
	- light gray clay, stiff at 84.0ft BGS				7 7			^
5	SAND, loose, medium sand, tan brown	34.89				ļ		0.
	S				4 4	l		



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-88

DATE COMPLETED: March 22, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM		
(BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
-95	- clay lens at 94.0ft BGS	24.89						0
-100	SAND, loose, medium sand, tan brown and light gray				र र र			0
-105			← cement/	 - 	4 4			
	SAND, medium sand, tan brown	14.89	BENTONITE GROUT		1			
-110					1 1			0.
-115	SAND, loose, fine-medium sand, tan brown	4.89	2°6 SCH 40 BLACK IRON					
-120			2'0 SCH 40 BLACK IRON RISER		444			
- 125	·							0.
-130								
-135		-17.11	2'0 SCH 80 PVC RISER		1 4 4			
-140	SAND, loose, fine-medium sand, tan brown and light gray				144			
-145					1 4			7.
- 150					144			,
-155								
-160								
- 165					144			
-170								0.
-175								
-	SILTY CLAY, stiff, dark gray	-57.11						
NO.	SILTY CLAY, stiff, dark gray TES: MEASURING POINT ELEVATIONS MAY CHANGE; F	REFER TO (URRENT ELEVATION TABLE		1 1	1		



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: MW-88
DATE COMPLETED: March 22, 2006

PROJECT NUMBER: 6003

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM	LE	
ft BGS	STRATIGRAPHIC DESCRIPTION of ALIMANNO	AMSL	MONTHOLING NEED INC.	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
185			CEMENT/ BENTONITE GROUT					0.0
-190 -195	SAND AND SILT, fine-medium sand, tan brown and light gray	-71.11	CEMENT/ BENTONITE GROUT		1 1 1			3.5
200	SILTY CLAY, stiff, dark gray	-77.11						
-205		-	270 SCH 40 BLACK IRON RISER		य स स स			0.0
-210 —	SAND AND SILT, trace clay, firm to stiff, fine sand, tan brown, orange mottles	-89.11			4 4			0.2
-215 -220	SAND, trace clay, firm, fine sand, orange brown, sweet odor	-97.11	2°0 SCH 80 PVC RISER					· 7.1
-225	CLAY, trace silt, stiff, light gray	-104.11			4 4			7.1
-230								0.2
-235	CLAY, stiff, dark gray	-114.11			44 4			0.1
-240	SAND AND SILT, trace clay, fine sand, tan brown and light gray, orange mottles				بجنجند			
-245					1 f 1 f		-	0.2
-250 -255					संस्थान			
-260	SAND AND SILT, thin clay layers, fine sand, tan brown and light gray, orange mottles	-137.11			<u> </u>			
-265					1111			3.3



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-88

DATE COMPLETED: March 22, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAME		
ft BGS	GIRATION THO BESSAR TION & REIN WHO	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
275	SAND AND SILT, fine sand, tan brown, orange mottles	-157.11	CEMENT/ BENTONITE GROUT BENTONITE CHIP SEAL		<u>ત્રને ને તે તે તે તે તે તે તે તે તે તે તે તે તે</u>			
285			BENTONITE GROUT BENTONITE CHIP SEAL		ক্ষরক্ষর ক্রক্রক্ষর			7.
290 -	SILTY CLAY, stiff, dary gray	-169.11	BENTONITE CHIP SEAL		राजासः बाजासः			O. ·
300	SAND AND SILT, fine-medium sand, tan brown, gray and orange mottles	-177.11			र्याच्या चार स्थानाचा चार			5.4
305	SAND, loose, medium sand, tan brown, sweet odor	-187.11	MW-88-D1		1 1 1 1 1			32
315	SAND AND SILT, trace clay, firm, fine sand, light gray	-192.11	SCH 80 PVC WELL SCREEN #1 SILICA SAND		.चस.स.स. जन्मानाचा			6.
320	SILTY CLAY, stiff, gray	-201.11			<u> </u>			0.0
330	SAND, loose, medium sand, tan brown, sweet odor	-207.11						
335			2°6 SCH 40					28.
345			BLACK IRON RISER					
350	SAND, trace silt, medium sand, tan brown	-227.11					-	5.8
355	,		ENTONITE CHIP SEAL					
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO (CURRENT ELEVATION TABLE					



Page 5 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-88

DATE COMPLETED: March 22, 2006

DRILLING METHOD: 6" ID ROTASONIC

ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS						111 0 I	_
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	SAND AND SILT, firm, fine sand, light gray	-240.11			4			
- 365								
					4			
-370								47.
-375					4			ı
					4			
-380	SAND AND SILT, firm, fine-medium sand, light gray	-259.11			1			ı
-385								58.
					4			ı
-390	- tan brown at 392.0ft BGS				4			ı
-395								35
-400		-279.11		: :				
400	SAND AND SILT, loose, fine-medium sand, pale red							i
405			#1 SILICA SAND		1			ı
-410			MW-88-D2					34.
			STAINLESS STEEL WELL SCREEN					i
-415								
-420	- tan brown at 420.0ft BGS							
					1			7.
-425								
-430	SAND, loose, fine-medium sand, tan brown	-309.11						
-435			BENTONITE CHIP SEAL					2.1
100								٤.
-440		-321.11		•	4 4			
-445	SAND AND SILT, medium sand, pale red				2			1.8



Page 6 of 6

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-88

DATE COMPLETED: March 22, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
		-329.11				_	-	
-455	END OF BOREHOLE @ 450.0ft BGS	-323.11	WELL DETAILS Screened interval: -184.11 to -194.11ft AMSL 305.00 to 315.00ft BGS Length: 10ft Diameter: 2in					
-460 -			Stot Size: 10 Material: SCH 80 PVC Seal:					
- 465 - 470			-171.69 to -176.78ft AMSL 292.58 to 297.67ft BGS Material: BENTONITE CHIPS Sand Pack: -176.78 to -199.53ft AMSL					
-475			297.67 to 320.42ft BGS Material: #1 SILICA SAND					
480			Screened Interval: -284.69 to -294.69ft AMSL 405.58 to 415.58ft BGS Length: 10ft		-			
-485			Diameter: 2in Stot Size: 10 Material: STAINLESS STEEL Seal:					
-490			-199,53 to -277.61ft AMSL 320,42 to 398.50ft BGS Material: BENTONITE CHIPS Sand Pack:					
495			-277.61 to -295.11ft AMSL 398.50 to 416.00ft BGS Material: #1 SILICA SAND					
-500								
- 505								
-510								
-515								
-520								
-525								
-530								
- 535								
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE	REFER TO	CURRENT ELEVATION TABLE					_

	PROI	ECT HUN	cksville, NV WRATHER (AM.)	gyear	HOLE DESIGNATION MW. 89 UATE/THE STARTED 12/6/10 DATE/THE COMPLETED 18/16/10 DEBLING MATHOD 500/2 CRA SUPERVISOR 5. DAL										
11	ATIGRAI TERVAI 3 IN ft,	S m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/COMPONENTS, SECONDARY COMPONENTS, RELATIVE DENSITY/COMPONENTS, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	3 7 7	S M M P E L T		SPLI (REC	SAMP PENETI RECO T SPO CORD 1 RECO	ZATION DRD ON BL	OW8	LS	S I A N M T P E L R	P / D F I	C A N E A L I C S L S	G R A I N S I
ů O	Ť	0 0	NOTE: FLASHCITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INLICATE IF MOISTURE WAS ADDED OR NOT).	1	G- D	6"	6*	6"	6"	N	R	Å	(ppm)		E
0		37	some fine sead + silf, loose										0.0		
40		53	dark gray/black silty clay, stiff			_							0.0		
53		57	tan brown to grayish brown medium sond. some fine sand trilt, loose										0.0		
57		74	grayish brown medium rand, some time some										0,0		
74		77	orangish - brown medium sand, loose	1				-			-		0.0		
77		97	light gray fine- medium sand clay lenses at 80-81, 85-87										0.0		
97		117	light gray fine-medium sand, clay leases at 100-101', 106-107', 113-114'										0.0		
c	NOTES AND OMMENT		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN DREN BIOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:				.			1	<u> </u>		1		

	PROI PROI CLIEN LOCA	ECT NAME ECT NUMBER TON	BER (*SE) DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR DETAINS CONTRACTOR (P.M.)				DATE, DATE, DRILL CRA	/TIME /TIME LING MI EUPER!	STARTE COMPLI THOD TISOR	ELED _		89		<u> </u>	
P P DEP	35 IN ft/m BGS SS SS SS SS SS SS SS SS SS SS SS SS S	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: BOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (MATHER OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, BERDATION/STRUCTURE, COLEUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	S M M P E L T		SPLI (REC	SAMP PENETI RECO CORD I RECO	RATION ORD ON BL	OWS UES	S	SI MT PE LR EY	P/ DF D	C A N A L Y S I S I S	GRAIN SIZ	
<u> </u>	Ť	0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E #	N O G D	6"	6*	8,	6"	N	R	I.	(ppm)		É
11		136	light gray medium sand, losse												
132		137	light gray + tan brown mottled fine some will some silt, firm										0.4		
/37		150	light gray medium Sand, loose		ļ	_							0.0		
150		157	light gray + tan brown fine-medium sand some sitt, from										0.0		
157		163	SAME		-			_				-	0.0		<u> </u>
163		167	tan brown silty clay, stiff	-	-	 							0.0	-	+
167		177	light gray medium sand, Some fine sand esilt										0.0		
177		192	light gray fine sand till, some medium sand orange mottles, firm	-	-					_			0.0	-	+
	NOTES AND DAMEN		DEPTH OF BREMDLE CANNG DEPTH OF FIRST GROUNDWATER ENCOUNTER _ WATER LEVEL IN OPEN BURKHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALLE, SAMPLE RECOVERY L NOTES:					HESS.		1					<u></u>

	PROJEC PROJEC CLIENT LOCATI	ET NUM	Height Rue Drilling Contractor BR 6333 GSITT SUPPLIE MEVATION FIGURE MEVATION (PM.)				DATE DATE DRILL CRA	/TIME /TIME LING M SJPER	STARTED COMPLE CTHOD _ VISOR _	RED		? ?			···
eptes P	TIGRAPE PERVALS IN ft/E		SAMPLE DESCRIPTION CRDER OF DESCRIPTORS: SOIL TYPE STMEOL(S) - PROMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CURSISTENCY, GRAIN SIZE/PLASTICTY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORE	8 M P	S A M M P E L T		SAMPLE DETAILS PENETRATION RECORD SPLIT SPOON BLOWS (RECORD N-VALUES & RECOVERES)				S	S i A N M T P E L R E V	P / I F	CHEMICAL	G R I N S I
R O M	A T	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	LE#	N O	6"	6"	6"	6"	N	R	E V A L	(ppm)	r s	Ż
72		(95	light gray medium sand, loose										0.0	-	<u> </u>
97		217	light gray + ten brown fine squal +silt										0.0		
217		225	dark gray silty clay, Stiff										0.0		
125		230	tan brown fine sand tsilt, firm										0.0		<u> </u>
230		232	dark gray sitty clay, st. ff			_	_						0.0		
23 2		237	organge braws fine send, loose	_			 						0.0		
231		257	Orange brown fine- med sand, loose				-						0.0		
45 7		262	SAME	F	-			1			-		0.0	-	
262		277	light gray fine sand, firm			-	<u> </u>	_				_	0.2		-
	NOTES AND DIMENTS	i	DEPTH OF BORE-IDLE CAYING DEPTH OF FRST GROUNDWATER ENCOUNTER WATER LEVEL, IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LINGUES:				DIL THIC		<u> </u>						

	PROJEK PROJEK CLIENT LOCATI	T NUM	HOCKS RUCO DECLER SER 6237 DECLER SUPPLER EXPLAIN H. CKSYLK, MY WEATHER (AM.) (P.M.)				DATE DATE DEIL	/TDOR S	TARTE COMPLI THOD	0 6720					
D.	ATIGRAPE TERVALS N [t/1	- T	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE BENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	B M M P E L T		SPLI (RE	PENETR RECO T SPOC CORD N RECOV	ATION ORU ON BL	ows urs	S	S I A N M T P E L R	P / D F I	C AN E LY SIGN	G A A N
M M	Ť	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO BOLL (INDICATE IF MOISTURE WAS ADDRO OR NOT).	E #	N O G D	8"	6*	6"	6"	N	R	E V	(ppm)	L S	1 2 1
271		297	tan brown fine Same, Sweet order										1.8		
297		517	tan brown med sand W/ Some time sand + silt, loose, sweet oder										3.4		
317		335	tan brown + light gray fine - medium seal + 511+, look, sweet odor										2.3		
333		33 8	light gray fine sand + silt, firm, sweet oder	1	ļ 								5.8		上
332		348	light gray fine - med sand filt, look										3.7		1
347		357	tan brown medium sand, loase, sweet oder										3.5	<u> </u>	\downarrow
357		373	tan brown + gray brown fine sand +silt,										5.8		<u> </u>
a	NOTES AND OMENTS		DEPTH OF BOREHOLE CANING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:										<u> </u>	<u> </u>	



Pi Ci	ROJECT HAM ROJECT HUM JEMT CATIOH	(1) (P.K.) (1) (P.K.)				DATE DATE DRILL CRA	/TIME : :/TIME LING MI SUPERI	STARTE COMPLI CTHOD /ISOR_	ELED _					
STRATIGI INTER DEPTHS IN	VALS ft/m BGS	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOLES) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE	S A MP L	S M M P E L T		SPLI (RE	PENETSATION RECORD ILOWS (RECORD N-VALUES) 6" 6" 6" N R L L (ppm)		CHENICAL SISTEMATION	G R I N S I				
Y T	0	NOTE: PLASTICITY DETERMINATION BEQUIRES THE ADDITION OF MOISTURE IF THI SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	E	G D	6"	6"	6"	8"	N	R	L			Z
377	377	tsilt, from, slight oder	<u> </u>									2.2		
377	327	reddish prown fine med sand, Sweetedor	+	₩		├			_			319		<u> </u>
	987	loose some silt										1.9		
387	397	reddish brown fine rand flow. Sweet oder									<u></u>	1.3		
397	408	reddish brown fine send, some silt slight										2.5		
	-+	oder	-	 	<u> </u>				ļ	-		-	 	╀
408	412	reddish brown fine-med sand, rome silt,	-									1.2		L
		Slight ader	+	┼		├	 -	 -		├—		\vdash		╁╌
428	434	light gray + reddish brown mattled fine										1.6		匚
		Sand + Silt, firm, no oder	- 	-	ļ	-	+-		-	 	<u> </u>	ļ		╁
434	450	light gray + reddish brown medium Sand			ļ	<u> </u>	ļ					3.0		F
		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER			TARRO	H TUIC	KNESS .		İ.	<u> </u>	l	<u>. </u>	L	_ـــــــــــــــــــــــــــــــــــــ
NOTI ANI COMME	D	WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY NOTES:											<u>.</u>	

PROJECT NAME: Hooker Ruco	G WELL INSTRUMENTATION LOG HOLE DESIGNATION: MW-89
PROJECT No: 6883	ØATE COMPLETED: 12/19/10
CLIENT: Glenn Springs Holdings	
LOCATION: Miskesville, NY	CRA SUPERVISOR: 5. Daly
	— ROAD BOX
	GROUND SURFACE
	CONCRETE COLLAR
	SAND / GRAVEL
	GROUT TYPE: Partland Coment/bentonite
	BOREHOLE Ø: 7 In
	MONITORING WELL Ø:in
	MONITORING WELL Ø: 2 in
TOP OF SEAL AT: 335 ft ft ft ft ft ft ft ft ft ft ft ft ft	SEAL TYPE: Bentonite Chipr
TOP OF SCREEN AT: 345 #	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 355 ft	SCREEN: Ø: 2 in SLOT SIZE: 10
TOP OF SEAL AT: 360 ft	SEAL TYPE: Bentonite Chips
BOTTOM OF SEAL AT: 375 ft	
TOP OF SCREEN AT: 380 ft 2	PACK TYPE: SAND, SIZE #0
	SCREEN; Ø: 2 In SLOT SIZE: 10
BOTTOM OF SCREEN AT: 390 ft_	211111
TOP OF SEAL AT: 391 ftft	SEAL TYPE: Bentonite Chips BOTTOM OF HOLE AT: 450 ft
置去保養等金	DOLLOW OF HOLLAL 120
SCREEN TYPE: X Continuous Slot Perfora SCREEN MATERIAL: X Stainless Steel HOLE DIAMETER: 418	PVC Other:
HOLE DIAMETER: 6 to 730 1 to 718	8 12 18 in DI+ D2 DI+ D2 DURATION: 2.5hrs - 7509915 Cach



Page 1 of 4

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D1

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAM		
ft BGS	GROUND SURFACE	123.31		NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
				<u> </u>		L	Ż	죠
	SAND AND SILT, with gravel, medium sand, orange		→ CONCRETE					
	brown]		
-5			MW-90D1 TOP OF			1		
:			TOP OF CASING		4 4	4		0.0
-10			122.93 ft AMSL		4	1		
						1		
-15			CEMENT/ BENTONITE]		
	SAND, with silt, with gravel, medium sand, orange	106.31	BENTONITE GROUT			1		
-20	brown					1		
			1 0 0 0		4	1		0.0
: _								
-25		96.31				1		
	SAND AND GRAVEL, loose, medium to coarse sand, tan brown		1.5" Ø SCH 40 BLACK IRON RISER			1		
-30	Sand, tan bioati		1.5" Ø SCH 40 BLACK IRON]		0.0
			RISER		4			
-35		87.31	MW-90D1 TOP OF CASING 122.93 ft AMSL CEMENT/ BENTONITE GROUT 1.5" Ø SCH 40 BLACK IRON RISER					
: F	SILTY CLAY, stiff, light gray SAND AND SILT, loose, fine sand, gray and orange	86.31			4	1		
40		83.31						
	SAND, loose, fine sand, tan brown, no odor					1		
-45			1" å SCH 80 PVC RISER			1		
-40			PVC RISER			1		0.0
						-		
-50					4	1		
]		
-55	SILTY CLAY, firm, light gray, no odor	68.31 66.31						
	SAND, loose, medium sand, no odor, tan brown	00.51			4	1		
-60						1		
		,]		
-65					4 4	1		
					4 4	1		0.0
-70						ŧ		
, ,						•		
75	j							
-75	- tan brown and grayish brown at 77.0ft BGS				1 1			
-80	į				2 2			
1								0.6
- 85					4			
Ì								
	TES: MEASURING POINT ELEVATIONS MAY CHANGE; RE	EED TO	LIBRENT ELEVATION TABLE			1		
<u>NO</u>	TES: MEASURING POINT ELEVATIONS MAY CHANGE; RE		SOLUCIAL ELECTRICATION INDEL					



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D1

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST		1	SAME		
BGS	STRATIGRAFIIO DESCRIPTION & REMARKA	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	SAND AND SILT, some clay, firm, fine sand, light gray with orange mottles	33.31			44			3.3
5	- orange mottles end at 97.0ft BGS				2			
00					य स स			3.3
05			CEMENT/ BENTONITE GROUT		रस			
110	SAND, loose, fine-medium sand, tan brown, sweet odor	13.31			24.4	4		2.7
15	- light gray at 117.0ft BGS		1.5" 0 SCH 44 BLACK IRON		1	बंद		
20			BLACK IRON RISER		4	4		
30					4.4.4	1		8.3
35			1° 0 SCH 80 PVC RISER		संस	3.4.4		
40	SAND AND SILT, trace clay, firm, fine-medium sand, light gray, sweet odor	-13.69	CEMENTI/ BENTONITE GROUT 1.5" © SCH 40 BLACK IRON RISER 1" © SCH 80 PVC RISER		નું નું નું નું નું નું નું નું નું નું			
145					-0' -0' -0	4 4 4		6.9
150					ગુનું હ	1		
155	U. and Belt grov	-33.69			4.4	1		
160	SAND, loose, medium sand, light gray		1 7 3 7 3 7 3 7 3		177	וח		
160								18.
170					41.41	1		
175	- sweet odor at 177.0ft BGS							



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MVV-90D1

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST	~			ш	~
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
					4 2			20.4
-185	SILTY CLAY, firm, light gray	-61_69						0.0
-190	SAND AND SILT, loose, fine-medium sand, tan brown	-66.69	CEMENT/ BENTONITE GROUT					1.:
- 195		-73.69			1 1			
-200	SAND, loose, medium sand, tan brown, sweet odor							
-205			1.5' © SCH 40 BLACK IRON RISER BENTONITE CHIP SEAL		1	1		34
-210					4 4	-		
-215			BENTONITE CHIP SEAL					
-220			1" 0 SCH 80					
-225			PVC RISER					80
-230			SAND PACK					
-235	SAND AND SILT, trace clay, firm, fine sand, tan brown	-113.69	WELL SCREEN MW-90D1		1			22
-240		-121.69	WELL SCREEN		2	.1		23
-245	CLAY, trace silt, stiff, light gray	-126.69	WELL DETAILS Screened interval: -114.69 to -119.69ft AMSL		1			0.
-250	END OF BOREHOLE @ 250.0ft BGS		238.00 to 243.00ft BGS Length: 5ft Diameter: 1.5in					
-255			Slot Size: 10 Material: STAINLESS STEEL Seal: -92,69 to -98,69ft AMSL					
-260			216.00 to 222.00ft BGS Material: BENTONITE CHIPS Sand Pack:					
-265			-98,69 to -121,69ft AMSL 222.00 to 245,00ft BGS Material: #1 SILICA SAND					
L	DTES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO	CURRENT ELEVATION TABLE					



Page 4 of 4

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D1

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL NEST			SAME	т т	
ft BGS	STRATIGIATING BEGGIAI TROTA A COMMITTE	AMSL		BER	₹	8		PID (ppm)
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (
		+						
		,	Screened interval:					
-275		1	-104.69 to -119.69ft AMSL 228.00 to 243.00ft BGS					
			Length: 15ft Diameter: 1in					
-280			Slot Size: 10 Material: SCH 80 PVC					
		1	Seal:					
- 285	,		-92.69 to -98.69ft AMSL 216.00 to 222.00ft BGS					
			Material: BENTONITE CHIPS Sand Pack:					
-290	•		-98.69 to -121.69ft AMSL 222.00 to 245.00ft BGS					
			Material: #1 SILICA SAND					
-295								
000								
-300				1				
-305							1	
300		1						
-310								
•,•								
-315								
-320								
-325								
-330			•					
				į				
-335								
	·							
-340								
-345								
250								
- 350								
- 26E								
-340 -345 -350 -355								
	NOTES: MEASURING POINT ELEVATIONS MAY CHANGE;	L		l	<u> </u>	L.,	<u> </u>	L



Page 1 of 5

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

DATE COMPLETED: March 28, 2006 DRILLING METHOD: 6" ID ROTASONIC

MW-90D2

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S. DALY

HOLE DESIGNATION:

LOCATION: HICKSVILLE, NY

SAMPLE ELEV. DEPTH MONITORING WELL ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS 'N' VALUE ft BGS PID (ppm) INTERVAL 8 REC (**GROUND SURFACE** 123.29 122.85 TOP OF CASING SAND AND SILT, with gravel, medium sand, orange CONCRETE 5 0.0 10 15 106.29 SAND, with silt, with gravel, medium sand, orange brown 20 0.0 25 96.29 SAND AND GRAVEL, loose, medium to coarse 1.5" Ø SCH 40 BLACK IRON RISER sand, tan brown 30 0.0 35 87.29 SILTY CLAY, stiff, light gray 86.29 SAND AND SILT, loose, fine sand, gray and orange 83,29 40 SAND, loose, fine sand, tan brown, no odor 45 0.0 50 68.29 55 SILTY CLAY, firm, light gray, no odor 66.29 SAND, loose, medium sand, no odor, tan brown 60 65 0.0 - 70 CORP.GDT -75 - tan brown and grayish brown at 77.0ft BGS £ 80 6883.GPJ 0.6 85 OVERBURDEN LOG NOTES:

MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



Page 2 of 5

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D2

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL	-		т—	PLE	
ft BG\$	Official tipe 2250 the first state of the first sta	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (nom)
	SAND AND SILT, some day, firm, fine sand, light	33.29						
	gray with orange mottles							3,3
-95	- orange mottles end at 97.0ft BGS					-		
:	- orange modes and droport 200							
100 :								3,:
105	•		CEMENT/	[3.
: 105			CEMENT/ BENTONITE GROUT					
110	SAND, loose, fine-medium sand, tan brown, sweet	13.29				┨		
	odor							2.
-115								
	- light gray at 117.0ft BGS							
120			1.5" Ø SCH 40 BLACK IRON RISER	"				
			KISER .					
-125								8.
-130 :								
135								
: '35 _	SAND AND SILT, trace clay, firm, fine-medium	-13.71				1		
-140	SAND AND SILT, trace clay, firm, fine-medium sand, light gray, sweet odor							
					:			
145								6.
]			
-150								
-155 		-33.71			<u> </u>	-		
160	SAND, loose, medium sand, light gray							
-160								
165								
								18
- - 170					•			
-175								
	- sweet odor at 177.0ft BGS							
	TES: MEASURING POINT ELEVATIONS MAY CHANGE	REFER TO C	CURRENT ELEVATION TABLE					



Page 3 of 5

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D2

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAM	1	r—
BGS	SHARIONAL HIS SESSION FISH CALLED SALE	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
								-2
		-61.71				ļ		
-185	SILTY CLAY, firm, light gray							
- 190	SAND AND SILT, loose, fine-medium sand, tan	-68.71	CEMENT/ BENTONITE			1		
	brown		BENTONITE GROUT					
- 195		-73.71						
-	SAND, loose, medium sand, tan brown, sweet odor	-/3./1						
-200								
			1.5" 6 SCH 40					
205			BLACK IRON RISER					;
				1				
-210		1						
045				1				
-215		,	BENTONITE CHIP SEAL			1		
-220								
-220	÷			1]		
-225	,							
								1
-230							ŀ	
- 235								
-	SAND AND SILT, trace day, firm, fine sand, tan	-113.71]		
-240	brown		M M					:
						İ		
-245	CLAY, trace silt, stiff, light gray	-121.71						
		100.74]	
-250	SAND AND SILT, loose, fine sand, tan brown	-126.71						
- 255		-133.71				-		
	SAND, trace silt, loose, fine-medlum sand, orange brown		BENTONITE					
-260			CHIP SEAL				İ	2
265								'
- 250 - 255 - 260 - 265								
		-145.71	WELL SCREEN CURRENT ELEVATION TABLE	.	<u> </u>	_		<u> </u>



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PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D2

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

COTU	DECORPTION & DEMARKS	ELEV.	MONITORING WELL	-		SAM		
EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	SAND, trace gravel, medium-coarse sand, orange	-148.71						6.9
[SILTY CLAY, stiff, massive, gray							0.0
275						1		7.5
280	SAND, firm, fine-medium sand, brown red orange gray	-155.71						38.0
285								36,0
290	SAND, trace clay, loose, moist, tan brown	-166.71						20.0
295								
300	SAND, trace silt, loose, fine-medium sand, tan brown, sweet odor	-173.71						
								17.
305								
310		-188.71			_	-		
	SILTY CLAY, stiff, dark gray							5.8
315			BENTONITE CHIP SEAL			1		0.0
320	SAND, trace silt, medium sand, light gray with orange mottles	-195.71	CHIP SEAL					
325								25.
330								
335	- loose, tan brown at 337.0ft BGS				-	-		
340								
340 345 350 355								59
350								
355		-233.71						
	END OF BOREHOLE @ 357.0ft BGS OTES: MEASURING POINT ELEVATIONS MAY CHANGE		WELL DETAILS			1_		<u></u>



Page 5 of 5

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: MW-90D2

DATE COMPLETED: March 28, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAM		
ft BGS	OHOMORA THO DESCRIPTION ATTENDANCE	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(mon) Cla
-365			Screened interval: -143.71 to -148.71ft AMSL -267.00 to -122.00ft BGS Length: 5ft Diameter: 1.5in Stot Size: 10					
-370 -375	,		Material: STAINLESS STEEL Seal: -135.71 to -138.71ft AMSL 259.00 to 262.00ft BGS Material: BENTONITE CHIPS Sand Pack:				,	
- 380			-138.71 to -158.71ft AMSL 262.00 to 280.00ft BGS Material: #1 SILICA SAND					
-385								
-390								
-395 -400								
-405								
-410								
-415								
-420								
-425								
-430		1						
-430 -435 -440 -445	·							
445								
770	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	DECED TO	CURRENT ELEVATION TARI E					
<u>TOM</u>	IES: MEASURING POINT ELEVATIONS MAT CHANGE,	INDICK TO						

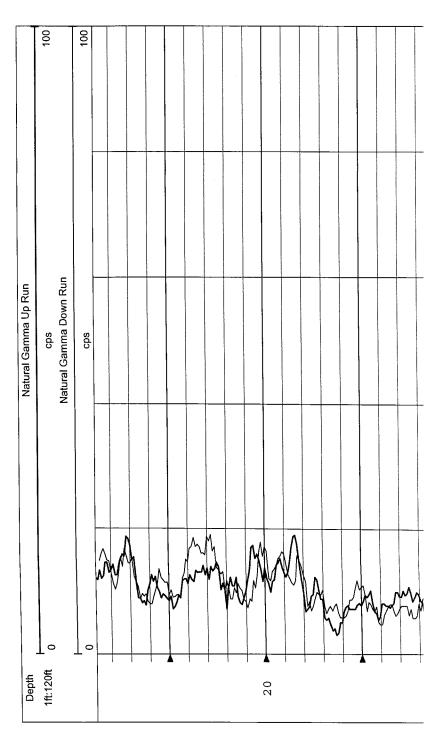
	PROJ	ECT NUM	BRR	DROLER SURFACE BLIVATION WRATHER (A.M.) (P.M.)						PAGE OF 3 HOLE DESIGNATION MW-92 DATE/TIME STARGED 3/4/11 DATE/TIME COMPLETED 3/4/11 DRILLING METHOD 544/7 CRA SUPERVISOR 5. Daly									
EPTHS F	R		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - FRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DESIGNATIVE COLOUR, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M P	S A M P E L T		SPL (RE	SAMP PENETE RECO T SPO CORD 1 RECO	RATION CRO CN HI N-VAL	OTS UES	ន	I A H T M T M T M T M T M T M T M T M T M T	P/ IF DF	CHEMICY CHATABI	G R A I N				
ŭ M	A T	T O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	8.	6 "	9.	8*	N	R	Y E	(ppm)	r a	I Z				
0		37	tan brown Medium Coarse sand & gravel some sitt										0.0						
		 	1 flar Fand , lorse		ļ										<u> </u>				
77		57	tan breyn fere - medium sand, losse, clay 50-51 +										0.1						
	-	 	54-57' no edge \$1.50'	_			-						ļ						
51		77	tan brown to light gray medium-coarse sand, logs										0.3						
77		87	dark brown fine sand + silt, firm										0.2						
רו	_	92	tan brown medium sand, loose										0.6						
72		97	tan brown + light gray fine sands silt, firm, oclor		ļ 				_				0.8						
37		112	light brown & gray silty clay , # stiff										0.0						
112		117	light gray fine sand, loose, Slight adar								_		0.3						
117		127	light gray fine medium sand, loose, oder										0.9						
c	notes and Ownen		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—VALUE, SAMPLE RECOVERY LINDTES:			TOPSO													

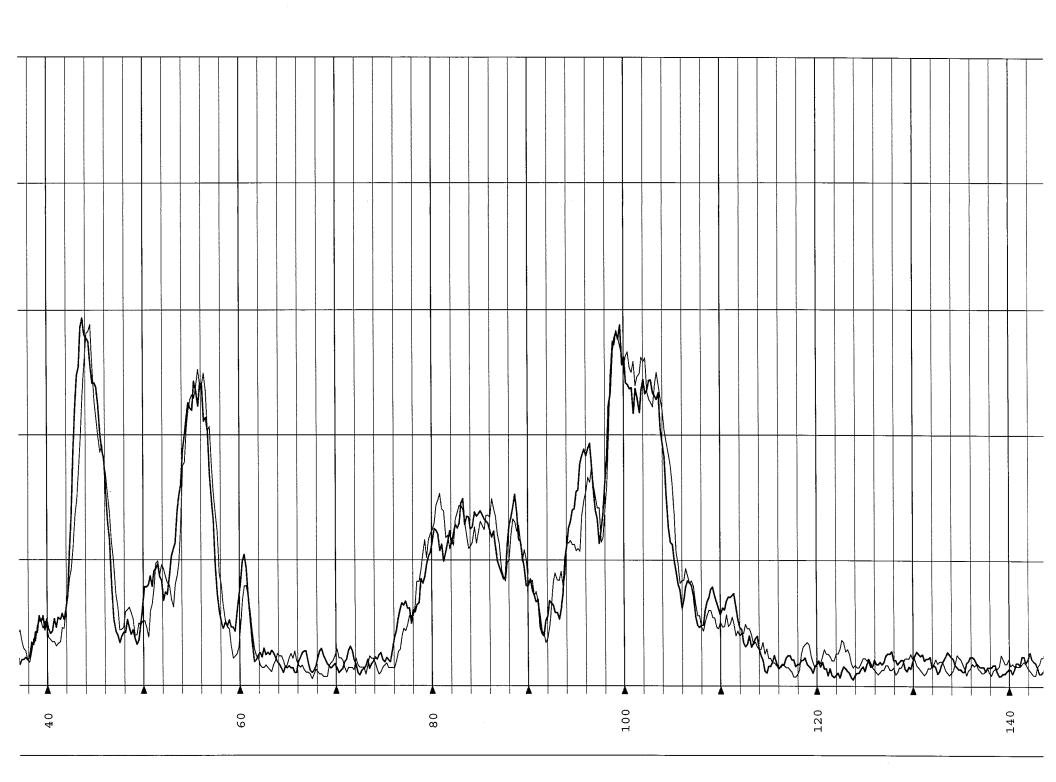
	(11.115)	NT G	X KSVIIIe, AV WEATHER (A.M.) (P.M.)	SURFACE ELEVATION						DATE/TIME STARTED 9/40 9/11 DATE/TIME COMPLETED 2/10/11 DRILLING METHOD 504: CRA SUPERVISOR 5. Daly								
11	ATIGRAI TERVAI 3 IN ft]	SAMP PENET REC T SPO	RATION	1	ā	8 I A N M T	F/	C A N E A L Y S	G R A I			
F R O M	A T	T O	GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	M P L E	PE LT IH NO GD	6"	(RE	CORD RECO	N-VALI	ues	R A		F / D F D D	E A M L I Y C A I S	N 9 1 2 E			
27		147	light gray medium sand, loose, odor										4.7					
12		157	light brown medium sand, loose										1.3					
57	.41-8	170	light brown fine- medium sand, some silt, firm					_					0.3					
70		177	light gray fine sund, loose, some med sand										0.9					
72		197	tan brown + light gray fine-most sand, some silt, loase										0,9					
97		217	light brown fine-medium sand, silty poduets, oder, fice										1.3					
217		237	light brown fine-medium sand, some silt, orlar										2.4					
231		247	broken rose barral sand to clay										_					
47		251	dork gray silty clay, stiff										0.0					
51		257	tan brown fine-medium sand+Filt, firm	Ŀ									0.3					
notes and comments		13	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LE NOTES:					NESS _										

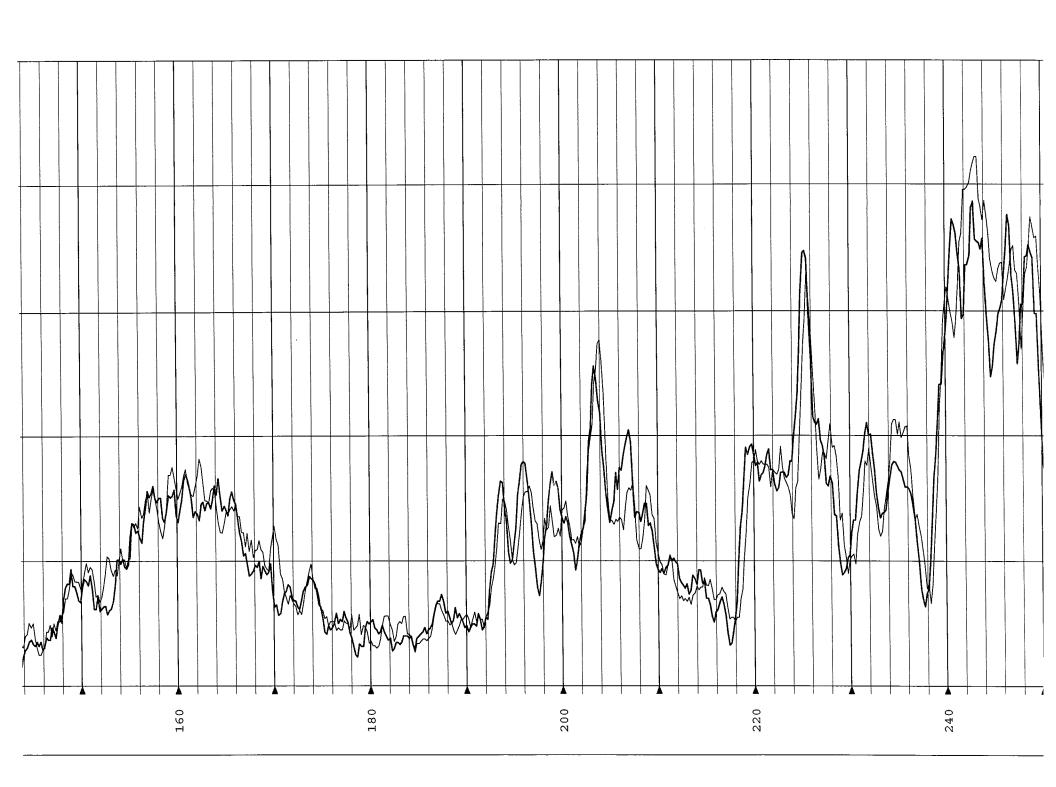


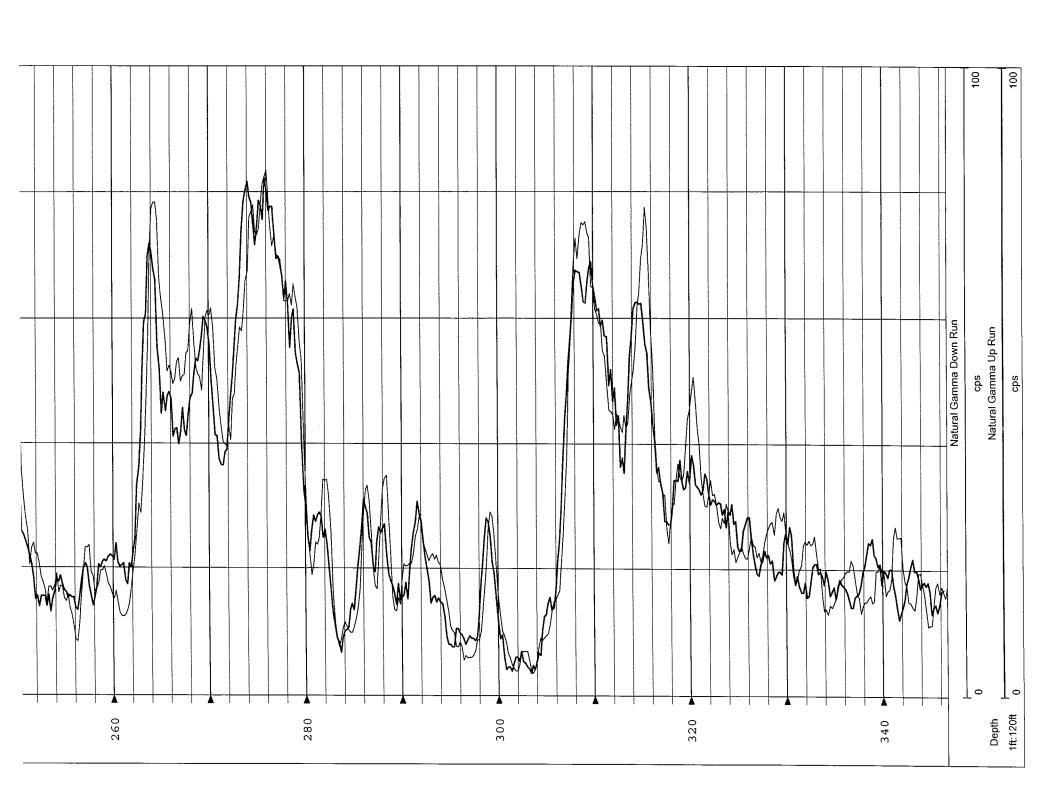
			STRATIGRAPHY LOG (OVI	-9414	_		DATE DATE DRILL CRA	DESIGNATIONS (ATTIME	STARTE COMPLI STHOD DSOR	50	3/ 8/ 3/ 10/ 20/y	1			
INT	TIGRAPI TERVALS IN ft/		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) — PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A M	8 4 4 7 F	·	SPLI (RE	SAMP PENETI RECO T SPO	LATION ORD ON BL	owe Ues	S	S I A N M T P E L R E V	P / 1 P T	C H A L Y S I L S I L S	G R A I N
F R O M	A	Ţ	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	P L E	LT IH NO GD	6"	6"	8°	verie:	s) N	R	E V	(ppm)	LS	I Z E
57		265	light brown + light gray fine-med sand + silt, firm	-	ļ								11.9		
65		217	light gray sitty sand , firm, some clay	1									0.0		
רדו		247	light gray silty clay, stiff	-								-	0.0		
80		297	fan brown fine-medium sand, Silty pockets, firm	-	-	-							37.0		
(17		310	light brown fine-medium rand, loore		-	-							11.6		
310		322	dark gray silty clay, stiff				1			1	-		0.0		 -
322		321	light gray fine sand soilt, firm, real mattles	-		-			-	-	-		0. 6		F
311		347	light gray fine sand + 5.14 , firm , no oder	1	-	-		-	-	-	+		0.0		-
	341	-	END OF BORING												
	NOTES AND COMMEN	='	DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTED WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT—SPOON SAMPLE, RECORD BLOW COUNTS, N—YALUE, SAMPLE RECOVER NOTES:					XHESS			-	1	<u> </u>		

1	3 S		n (Court, Be	OPHYSICS					
				COMPAN WELL ID FIELD TOWN		RUCO SUPEI			NEW YO	DR K
CO WELL	FLD	CTY STE	FILING No	LOCATION SLEEPYS PA		RGE			OTHER SE	
LOGGIN LOG ME DRILLII	EAS. F	ROM	гом	20 FEET / MI		ELEVATION	1		COMMEN	TS
DATE				MARC	H 11, 2011	TYPE FLU	ID IN HOLE		WATER	
DRILLIN	NG C	D.			,	SALINI			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
TYPE LO		<u> </u>					JCTIVITY			
DEPTH-		LER		347 FE	ET	LEVEL			50 FEET	
DEPTH-				.347.8 I		MAX. REC				
BTM LC			RVA							
TOP LO	GGEI	INTE	RVAI							
OPERA'	TING	RIG TI	ME		-					
RECOR	DED	BY		BENJA	AMIN RICE					
WITNES	SSED	BY		STEV	E DALY					
RUN	D/	DETIO	ED.	ECORD		CASING R	ECORD			
NO.	BI			FROM	ТО	SIZE	WGT.	FRO	M	TO
110.	101		\dashv	I ICOM		8 INCH	STEEL	0 FEI		20 FEET
	+		-+			7 INCH	STEEL	0 FEI		150 FEET
-	+		\dashv			6 INCH	STEEL	0 FE		347.8 FEET
	+		+			3		1 2	 .	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	_						1			
			ı						_	









TOP OF SEAL AT: 200 ft SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE SCREEN AT: 215 ft SEAL AT: 201 ft SEAL AT: 201 ft SEAL AT: 202 ft SCREEN AT: 203 ft SEAL TYPE: SAND, SIZE SCREEN AT: 204 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft S	
TOP OF SEAL AT: 200 ft SCREEN AT: 210 ft TOP OF SCREEN AT: 215 ft TOP OF SCREEN AT: 255 ft SCREEN AT: 265 ft SCREEN AT:	
TOP OF SEAL AT: 200 ft SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE SCREEN AT: 215 ft SEAL AT: 201 ft SEAL AT: 201 ft SEAL AT: 202 ft SCREEN AT: 203 ft SEAL TYPE: SAND, SIZE SCREEN AT: 204 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft SCREEN AT: 205 ft SEAL TYPE: SAND, SIZE SCREEN AT: 205 ft S	
TOP OF SEAL AT: 200 ft SOTTOM OF SCREEN AT: 215 ft TOP OF SCREEN AT: 215 ft TOP OF SCREEN AT: 215 ft TOP OF SCREEN AT: 215 ft SCREEN AT: 2	
TOP OF SEAL AT: 200 ft BOTTOM OF SCREEN AT: 215 ft TOP OF SCREEN AT: 215 ft TOP OF SCREEN AT: 215 ft S	
TOP OF SEAL AT: 200 ft BOTTOM OF SCREEN AT: 215 ft TOP OF SCREEN AT: 255 ft TOP OF SCREEN AT: 255 ft S	SURFACE
TOP OF SEAL AT: 100 ft BOTTOM OF SCREEN AT: 115 ft TOP OF SCREEN AT: 125 ft SCREEN A	•
BOREHOLE Ø:	
TOP OF SEAL AT: 200 ft	
BOREHOLE Ø: BOREHOLE Ø:	
TOP OF SEAL AT: 200 ft	
TOP OF SEAL AT: 200 ft	,
TOP OF SEAL AT: 200 ft SEAL AT: 205 ft SEAL TYPE: 200 ft SCREEN AT: 210 ft SEAL AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 34 SEAL TYPE: 200 ft SEAL AT: 206 ft SCREEN TYPE: 200 ft SCR	separant/grout
TOP OF SEAL AT: 200 ft SEAL AT: 205 ft SEAL TYPE: 200 ft SCREEN AT: 210 ft SEAL AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 34 SEAL TYPE: 200 ft SEAL AT: 206 ft SCREEN TYPE: 200 ft SCR	
TOP OF SEAL AT: 200 ft SEAL AT: 205 ft SEAL TYPE: 200 ft SCREEN AT: 210 ft SEAL AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SEAL TYPE: 200 ft SCREEN AT: 215 ft SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 34 SEAL TYPE: 200 ft SEAL AT: 206 ft SCREEN TYPE: 200 ft SCR	In
TOP OF SEAL AT: 200 ft SEAL TYPE: Revision CASE TOP OF SCREEN AT: 210 ft SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 255 ft SCREEN AT: 265 ft SCREEN AT: 266 ft SCREEN TYPE: Continuous Slot Perforated Louvre Othec	
TOP OF SEAL AT: 200 ft SEAL TYPE: Revision CASE TOP OF SCREEN AT: 210 ft SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 215 ft SEAL TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 255 ft SCREEN AT: 265 ft SCREEN AT: 266 ft SCREEN TYPE: Continuous Slot Perforated Louvre Othec	2 In
TOP OF SEAL AT: 206 ft SEAL TYPE:	-
BOTTOM OF SEAL AT: 105 ft PACK TYPE: SAND, SIZE SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN BOTTOM OF SEAL AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN BOTTOM OF SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN BOTTOM OF SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN BOTTOM OF SCREEN AT: 105 ft SEAL TYPE: SAND, SIZE SCREEN TYPE: SEAL TYPE: SAND, SIZE SCREEN TYPE: SEAL TYPE: SAND, SIZE SCREEN TYPE: SEAL TY	in
BOTTOM OF SEAL AT: 105 ft PACK TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 115 ft SEAL TYPE: SAND, SIZE BOTTOM OF SEAL AT: 115 ft SEAL TYPE: Bratis Chi BOTTOM OF SEAL AT: 155 ft SCREEN AT: 165 ft SCREEN AT: 165 ft SCREEN AT: 165 ft SCREEN AT: 165 ft SCREEN AT: 165 ft SEAL TYPE: Bratis Chi BOTTOM OF SCREEN AT: 165 ft SCREEN AT: 165 ft SEAL TYPE: Bratis Chi BOTTOM OF SCREEN AT: 165 ft SCREEN AT: 165 ft SCREEN TYPE: Continuous Slot Perforated Louvre Other:	
BOTTOM OF SCREEN AT: 216 ft SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SEAL TYPE: SAND, SIZE SEAL TYPE: SAND, SIZE SCREEN: Ø: 2 in PACK TYPE: SAND, SIZE SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 2 in SCREEN: Ø: 3 in SCREEN: Ø: 3 in SCREEN TYPE: SAND, SIZE SCREEN: Ø: 3 in SCR	395
BOTTOM OF SCREEN AT: 216 ft SEAL TYPE: Bontom Chi BOTTOM OF SEAL AT: 255 ft PACK TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 265 ft SCREEN AT: 266 ft SEAL TYPE: Bontom Chi BOTTOM OF SCREEN AT: 266 ft SEAL TYPE: Bontom Chi BOTTOM OF SCREEN AT: 266 ft SEAL TYPE: Bontom Chi BOTTOM OF HOLE AT: 345 SCREEN TYPE: Continuous Slot Perforated Louvre Other:	井0
BOTTOM OF SCREEN AT: 115 ft SEAL TYPE: Bentanile Chi BOTTOM OF SEAL AT: 150 ft PACK TYPE: SAND, SIZE BOTTOM OF SCREEN AT: 255 ft SCREEN: Ø: 2 in BOTTOM OF SCREEN AT: 206 ft SEAL TYPE: Bentanile Chi BOTTOM OF SCREEN AT: 206 ft SEAL TYPE: Bentanile Chi BOTTOM OF HOLE AT: 345 SCREEN TYPE: Continuous Slot Perforated Louvre Other:	
BOTTOM OF SEAL AT: 150 ft PACK TYPE: SAND, SIZE SCREEN TYPE: SAND, SIZE PACK TYPE: SAND, SIZE SCREEN: Ø: 2 in SEAL TYPE: Bottom of Chip BOTTOM OF SEAL AT: 266 ft SEAL TYPE: Bottom of Hole AT: 34	SLOT SIZE: 10
BOTTOM OF SEAL AT: 150 ft PACK TYPE: SAND, SIZE SCREEN TYPE: SAND, SIZE PACK TYPE: SAND, SIZE SCREEN: Ø: 2 in SEAL TYPE: Bottom of Chip BOTTOM OF SEAL AT: 266 ft SEAL TYPE: Bottom of Hole AT: 34	
BOTTOM OF SEAL AT: 150 ft PACK TYPE: SAND, SIZE SCREEN TYPE: SAND, SAND, SIZE SCREEN TYPE: SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND, SAND,	•3./
TOP OF SCREEN AT: 255 ft PACK TYPE: SAND, SIZE SCREEN: Ø: 2 In SCREEN: Ø: 2 In SCREEN: Ø: 2 In SCREEN: Ø: 2 In SCREEN: Ø: 2 In SCREEN: Ø: 34 SCREEN TYPE: Bottom of Hole at: 34 SCREEN TYPE: Continuous Slot Perforated Louvre Other:	
SCREEN TYPE: Continuous Slot Perforated Louvre Other:	مه م
BOTTOM OF SCREEN AT: 205 ft SEAL TYPE: Bottom in Chip BOTTOM OF HOLE AT: 34	710
BOTTOM OF SCREEN AT: 266 ft SEAL TYPE: Bottom in Chip BOTTOM OF HOLE AT: 34- SCREEN TYPE: Continuous Slot Perforated Louvre Other:	SLOT SIZE: 10
TOP OF SEAL AT: 266 ft SEAL TYPE: Boutonite Chir BOTTOM OF HOLE AT: 34	•
BOTTOM OF HOLE AT: 34-	os
	<u>7</u> ft
DVC Dther	
HOLE DIAMETER: 6"+3347 7"+3221 In	•

	CLUE	NT	IB Mosler Kuko DRILLING CONTRACTOR Boart Land	SURFACE ELEVATION DATE/TIME COMPLETE: WEATHER (A.M.) DRILLING METHOD (P.M.) CRA SUPERVISOR 1										2/28/11 Senic						
	ATIGRAI		SAMPLE DESCRIPTION					SAMP						C A I	G					
(DEPTH	ntervai 3 in 11	(15) /m 1803	ORDER OF DESCRIPTORS:		8			PENET				8 I	T	HN	R					
F R O			SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S M P L	M M P E L T I H		SPLI (RE	REC T SPO CORD I RECO	DRU ON BI V-VAL	owe Ues		A T E R V	P / 1 F 1 I	E A M Y S I A L S	N S					
M	A T	O	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ē	ЙO	e"	6"	6"	6"	N	R	A	D	LS	Z					
0		37	dark brown + tan brown medium - coarse send + gravel		9.5	 	H				-:-	L	(ppm) 0.0		_ E					
			wi flow sand + sift (fill)		<u> </u>		_			_	\vdash		0.0							
20		<u> </u>								_										
37		50	light brown medium sand, loose										0.0							
50			1: the brown + light gray fine sandisily firm																	
30		57	light brown & light gray fine sand 15ilt, firm										0.0							
57		77	light brown + light gray fine-medium sand, loose										0.0							
71		97	light brown + light gray fine-medium sand, loose Clay lens & 84'										0.1							
		-	Clay lens a 84"																	
97		117	light gray fine sand tilt, firm, slight sweet odor										0.7							
117		10-7																		
· · ·		/37	light gray medium sand, loose, slight sweetodor		ļ								0.4							
137		147	No Recovery		ļ	<u> </u>	-			<u> </u>			ļ	 						
		" · ·	IAA Ler LONELA		 -		ļ													
147		167	light gray medium sand, loose, slight odor		<u> </u>	-							1.4							
	notes And Ments		DEPTH OF BOREHOLE CAVING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON GOMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LED NOTES:			TOPSOIL		NESS _												

PROJEC PROJEC CLIENT LOCATIO	אטא ד (BER 6887 DRILLING CONTRACTOR Reach Lander Grant Lander Grant Grant Lander Grant Gran	GURFACE ELEVATION						HOLE DESIGNATION MW-93 DATE/TIME STARTED Z/27/11 DATE/TIME COMPLETED Z/19/11 DRILING METHOD Somic CRA SUPERVISOR S. Daly								
STRATIGRAPHIC INTERVALS EPTHS IN IL/IN BGS		SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DESIGNATY/CONSISTENCY, GRAIN SUZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	8 A M P L E	S A M M P E L T		PE SPLIT (RECO	ENETRATION ENECORD 1 SPOON BLOWS ORD N-VALUES				S I A N T P E L R	P / D F	G A L I Y	G R A I N			
R 0 A M T	T 0	NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	L E	I H N O G D	8"		e"	VERIES 6") N	R	E V	D	A 1 L S	I Z E			
67 1	71	light gray fine sand, some silt, firm, no oder							_			(ppm) 0.0					
17 1	87	brownish gray medium sand, loose, slight oda										0.4					
37 /	97	light gray + light brown fine sand trill, some pockets of medium sand, firm										2.5					
97 :	207	tan brown fine- medium sand, loose										2.6					
,01 ;	117	fan brown fine-medium sand, loose										11.1					
17 1	21	tan busun fine sand, some medium sand, firm										7.2					
27	237	reddish brown medium Sand, loose										3.3					
37	ИΊ	clark gray Silty clay, Stiff										0.0	_				
41	257	fan brown fine sand + silt , clayer pockets throughout										1.8					
NOTES AND COMMENTS		DEPTH OF BOREHOLE CAYING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS: NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LENGTES:				IL THICKNI	- SS _						J				

	PROI	ECT NUM ET	Gruf Surface Elevation Surface Elevation (F.M.)	DRILLER DRIVER ELEVATION DRIVER (A.M.) CF.M.)							HOLE DESIGNATION DATE/TIME STARTED 7/21/1 DATE/TIME COMPLETED 3/22/1 DRILLING METHOD 60/C CRA SUPERVISOR 5. Daily									
IN	TIGRAF TERVAL	B	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS:		В					ETAII	S	a ,		C A H N	G R					
r R		n BG8	SOIL TYPE SYMBOL(S) - PRIMARY COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS	S A N P L	M M P E L T I H		SPLI (REC	PENETI REC T SPO CORD I RECO	ORD ON BL N-VAL	OWS UES	·	SANTER	P / D F I	E A L C S A I S L	I N S					
K O	1 1	0	RADIE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	Ĭ	N O	8"	8"	6"	8*	N	R	E Y	(ppm)	L S	Z					
257		275	reddish brown medium Sand , loose										1.5		- 44					
75		271	light gray sifty clay, stiff										0.0							
277		287	reddish prown fine-medium sand, firm										6.8							
ชา		297	reddish brown fine-medium squ'e fice										12.2							
97		304	tan brown medium sand, loose										9.9							
બ		320	dork gray 5:1ty clay, 5tiff										0.0							
20		327	light gray fine sand + silt, some medium sand, loose							-			1.1							
27		347	ight gray fine sand, some medium sand toilt, firm										10.7							
	347		End of Boring																	
	ETTON		DEPTH OF BOREHOLE CAMING DEPTH OF FIRST GROUNDWATER ENCOUNTER WATER LEVEL IN OPEN BIOREHOLE ON COMPLETION AFTER HOURS COMPLETION DETAILS:		<u> </u>	TOPSO	IL THICK	ness _	<u> </u>		-									



PROJECT No: 6883 CLIENT: GS HI LOCATION: HICCSVILLE, NV	DATE COMPLETED: 3/3/11 DRILLING METHOD: 5001C CRA SUPERVISOR: 51 Daly
TOP OF SEAL AT: 195	GROUND SURFACE CONCRETE COLLAR SAND/GRAVEL GROUT TYPE: Portland Cement/bentanic BOREHOLE Ø: G in MONITORING WELL Ø: 2 in MONITORING WELL Ø: 2 in SEAL TYPE: Bentanite Chips PACK TYPE: SAND, SIZE #0 SCREEN: Ø: 2 in SLOT SIZE: 10 SCREEN: Ø: 2 in SLOT SIZE: 10 SEAL TYPE: Bentanite Chips SCREEN: Ø: 2 in SLOT SIZE: 10 SEAL TYPE: Bentanite Chips SEAL TYPE: Bentanite Chips BOTTOM OF HOLE AT: 347 ft
SCREEN TYPE: Continuous Slot Perforated SCREEN MATERIAL: Stainless Steel P HOLE DIAMETER: 6" fo 347' 7" fo 217' DEVELOPMENT: METHOD: 0'r 1:f4	VC Other:in

PROJECT NAME: Hocker Russ PROJECT No: 6883			SIGNATION: V2-(MPLETED: 3/15//)
CLIENT: GSHI			METHOD: Sonic
LOCATION: Hicksville, NY			PERVISOR: S. Doly
	<u> </u>	4/4	GROUND SURFACE
	Впп	Š	
7			— BOREHOLE Ø:
TOP OF SEAL AT: 3 ft_		107434	- SEAL TYPE: Bontante Chip
BOTTOM OF SEAL AT: 4 ft_			,
			- RISER PIPE Ø: / MATERIAL: 5d. 40 PVC
TOP OF SCREEN AT: 6 ft_	- - -	\	— PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: ft			- SCREEN Ø: / MATERIAL: SCL 40 PVC
TOP OF SEAL AT: 9 ft			MATERIAL: Sch 40 PVC
TOP OF SEAL AT: ft			Real 1.01:
BOTTOM OF SEAL AT: 12 ft			- SEAL TYPE: Bentonite Chip
		A SA	
			- GROUT TYPE: Portland Cement/buni
TOP OF SEAL AT: 37 ft_			•
			- SEAL TYPE: Bentonile Chip
BOTTOM OF SEAL AT: 39 ft			SEAL TYPE: OUTBANTE Chip
			BIOSE BIDE G
TOP OF SCREEN AT: 4/ ft			- RISER PIPE Ø:
			4.
•			— PACK TYPE: SAND, SIZE #0
	0 -		1
	8		- SCREEN Ø:
SOTTOM OF SCREEN AT: 46 ft_			
	- [::::::::::::::::::::::::::::::::::::	لنند	_ BOTTOM OF HOLE AT: 47
		—	
_	•		Louvre Other:
_	less Steel	PVC [Other:
OLE DIAMETER: 6			
EVELOPMENT: METHOD: -		DU	JRATION:

PROJECT NAME: Hoolar Ruco	HOLE DESIGNATION: VZ-2 *DATE COMPLETED: 2/12/11
CLIENT: GSHI	DRILLING METHOD: Sonic
ocation: Hicksville, NY	CRA SUPERVISOR: S. Daly
	GROUND SURFACE
	ļД 🖟
TOP OF SEAL AT: 3 ft	BOREHOLE Ø:
	SEAL TYPE: Bentonite Chip
BOTTOM OF SEAL AT: 4 ft ft	*** **********************************
	RISER PIPE Ø: MATERIAL: 5ch 40 PVC
TOP OF SCREEN AT:	
BOTTOM OF SCREEN AT: 8 ft	SCREEN Ø:
—— ~[,; · C	MATERIAL: Sch 40 PVC
TOP OF SEAL AT: 18.5 ft	
	SEAL TYPE: Bentonite Chip
BOTTOM OF SEAL AT: 11 #	
	GROUT TYPE: Portland Cement/benton
TOP OF SEAL AT: 37 ft	
	SEAL TYPE: Bentonite Chips
BOTTOM OF SEAL AT: 42 ft	50.2 m z
	PIOSE DIDE G
TOP OF SCREEN AT: 44 ft	RISER PIPE Ø: MATERIAL: 5-4 40 PVC
	PACK TYPE: SAND, SIZE #0
	PACK TYPE: SAND, SIZE #0
	SCREENØ:
	MATERIAL: Sch 40 PVC
OTTOM OF SCREEN AT: 49 ft	BOTTOM OF HOLE AT: 57
<u> </u>	BOTTOM OF HOLE AT:
CREEN TYPE: AIR: X Continuous Slot	Perforated Louvre Other:
CREEN MATERIAL: AIR: Stainless Steel	PVC Other:
OLE DIAMETER:	

PROJECT NAME: 1/00/12 RUCO PROJECT No: 4883	HOLE DESIGNATION: VZ-Y *DATE COMPLETED: 4/30/11
CLIENT: GSHI	DRILLING METHOD: Sonic
LOCATION: Hicksville, Ny	CRA SUPERVISOR: 5. Daly
	GROUND SURFACE
	BOREHOLE Ø:6
TOP OF SEAL AT: 3 ft S	SEAL TYPE: Beatenite Chips
BOTTOM OF SEAL AT: 4 ft ft ft ft ft ft ft ft ft ft ft ft ft	556
	RISER PIPE Ø: MATERIAL: Sch 40 PVC
TOP OF SCREEN AT:	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 8 ft	SCREEN Ø: / MATERIAL: Sch 40 PVC
TOP OF SEAL AT: 9 ft	MATERIAL: 324 40 PVC
TOP OF SEAL AT: ft	0711 707 P 1 1 1/1
BOTTOM OF SEAL AT: 14 ftft	SEAL TYPE: Bentonite Chips
	GROUT TYPE: Portland Coment/buttonite
TOP OF SEAL AT: 39 ft	
	0 1 1 1
BOTTOM OF SEAL AT: 41 #	SEAL TYPE: Bentanite Chips
TOP OF SCREEN AT: 43 ft	RISER PIPE Ø:
	1
	PACK TYPE: SAND, SIZE #0
# 15	SCREEN Ø: MATERIAL: Sch 40 PVC
SOTTOM OF SCREEN AT: 48 ft	i o i i i i i i i i i i i i i i i i i i
	BOTTOM OF HOLE AT:
CREEN TYPE: AIR: K Continuous Slot	Perforated Louvre Other:
CREEN MATERIAL: AIR: Stainless Steel	
OLE DIAMETER:	
	DURATION:

VADOSE ZONE MONITORING	WELL INSTRUMENTATION LOG
PROJECT NO: 6883	HOLE DESIGNATION: VZ-5
PROJECT No: 6883	*DATE COMPLETED: 3/11/11
CLIENT: GSHI	DRILLING METHOD: Sonic
LOCATION: Hrcksville, NY	cra supervisor: S. Daly
1886	GROUND SURFACE
	GROUND SURFACE
	BOREHOLE Ø: 6
TOP OF SEAL AT: 3 ft	7 62 54
BOTTOM OF SEAL AT: 4 ft	SEAL TYPE: Bentonik Chi,
	RISER PIPE Ø: / In MATERIAL: 5ch 40 PV
TOP OF SCREEN AT:	PACK TYPE: SAND, SIZE #0
~	
BOTTOM OF SCREEN AT: 8 ft 1	SCREEN Ø:ini
TOP OF SEAL AT: 9 ft ft	
	seal type: Bentonile Chir
BOTTOM OF SEAL AT: 14 ft ft	を持ちた。
	2 11 1
	GROUT TYPE: Portland Coment/bontonite
31	STANDARD
TOP OF SEAL AT: 37 ft	
20	SEAL TYPE: Bontonite Chip
BOTTOM OF SEAL AT: 39 ft ft	
	RISER PIPE Ø: In MATERIAL: 5ch 40 PVC
TOP OF SCREEN AT: 41 ftft	MATERIAL: 5ch 40 PVC
	PACKETORS SAND SIZE # D
	PACK TYPE: SAND, SIZE #D
	SCREEN Ø:
	MATERIAL: Sch 40 PVc
BOTTOM OF SCREEN AT: 46 ft	
<u> </u>	BOTTOM OF HOLE AT: 47 ft
SCREEN TYPE: AIR: Continuous Slot Pei	rforated Duvre Other:
/	PVC Other:
FOLL DIMINETELL.	
DEVELOPMENT: METHOD:	DURATION:

	HOLE DESIGNATION: VZ-C
PROJECT No: 6883	DATE COMPLETED: 2/26/11
CLIENT: GSHI	DRILLING METHOD: Sonic
LOCATION: //: cksville, NY	CRA SUPERVISOR: 5. Daly
ل ابخ پ	GROUND SURFACE
X W	BOREHOLE Ø: 6
TOP OF SEAL AT:ft	SEAL TYPE: Bentonite chips
BOTTOM OF SEAL AT: 4 ft ft	(2) (2) (2) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4
	RISER PIPE Ø: / MATERIAL: CC4 40 PVC
TOP OF SCREEN AT: 6 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 8 ft_	SCREEN Ø: MATERIAL: SCL 40 PVC
<u> </u>	MATERIAL: SCL 40 PVC
TOP OF SEAL AT: 9 ftft	
BOTTOM OF SEAL AT: 16 ft	SEAL TYPE: Bentonite Chips
BOTTOMOF BEALAIL	
	TANK TO STANK
	GROUT TYPE: Portland Cement/benton
	GROUT TIPE: TOTTANH COMERT/DELINA
TOP OF SEAL AT:	
TOP OF SEAL AT: II II	
U ₂	SEAL TYPE: Bentonite Chips
BOTTOM OF SEAL AT: 42 ft ft	
	RISER PIPE Ø:
TOP OF SCREEN AT: 49 ft ft	MATERIAL: Sch 40 PVC
	PAGETYPE DAND OUT #0
	PACK TYPE: SAND, SIZE
[1] [1] [1] [1] [1] [1] [1] [1] [1] [1]	SCREEN Ø:
M.	MATERIAL: Sch 40 PVC
OTTOM OF SCREEN AT: 49 ft	
<u>Profes</u>	BOTTOM OF HOLE AT: 57
-	
CREEN TYPE: AIR: X Continuous Slot	Perforated Louvre Other:
CREEN MATERIAL: AIR: Stainless Steel	PVC Other:
DLE DIAMETER:	
VELOPMENT: METHOD:	DURATION:



Page 1 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: VZ-10

DATE COMPLETED: January 11, 2005

DRILLING METHOD: 6" ID ROTASONIC

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST	~		SAMF	- 1	Γ
BGS	GROUND SURFACE	AMSL 121.90		NUMBER	INTERVAL	REC (%)	N' VALUE	
	SILTY SAND, trace gravel, light brown, no odor			2	<u> </u>	-	٤	-
			VZ-10S TOP OF CASING 121.81 ft AMSL VZ-10D TOP OF CASING					
0	SAND AND GRAVEL, medium to coarse sand, fine gravel, dry, light brown and red brown, no odor	115.90	121.81 ft AMSL #1 SILICA SAND 11 0 SCREEN (1/8" HOLES 1" APART, FILTER CLOTH COVER)	1,111				
12	•		BENTONITE CHIP SEAL					
16	SAND, trace silt, medium grained sand, light brown, moist, no odor	105.90						
20			1" Ø SCH 40 PVC RISER			:		
22								
26	- trace gravel at 26.0ft BGS							
28			CEMENT/ BENTONITE GROUT					
30		=						
34								
36	CLAY, trace silt, stiff, dark brown	85.90						
38								
40								



Page 2 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: VZ-10

DATE COMPLETED: January 11, 2005

DRILLING METHOD: 6" ID ROTASONIC

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST			SAM		
R BGS	STATIONAL TIO DECONIC PION OF TENENTS	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
44 46 48	SAND, fine grained, light brown, moist, no odor	75.90	BENTONITE CHIP SEAL					-
60 62 64	CLAY, high plasticity, dark gray, wet, no odor	65.90	SAND PACK 1" 0 SCREEN (1/8" HOLES 1" APART, FILTER CLOTH COVER)			Amaza pinama pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka pinaka		
60	END OF BOREHOLE @ 60.0ft BGS	61.90	WELL DETAILS Screened interval:					
52 54	STRATIGRAPHY OF VZ-10 FROM MW-83		115.90 to 113.90ft AMSL 6.00 to 8.00ft BGS Length: 2ft Diameter: 1In					
66			Slot Size: 125 Material: SCH 40 PVC Seal: 118.90 to 117.90ft AMSL 3.00 to 4.00ft BGS					
70			Material: BENTONITE CHIPS Sand Pack: 117.90 to 113.40ft AMSL 4.00 to 8.50ft BGS Material: #1 SILICA SAND					
'2 '4			Screened interval: 70.90 to 65.90ft AMSL 51.00 to 56.00ft BGS					
6			Length: 5ft Diameter: 1in Slot Size: 125 Material: SCH 40 PVC					
6 8 0 2			Seal: 74.90 to 72.90ft AMSL 47.00 to 49.00ft BGS Material: BENTONITE CHIPS Sand Pack: 72.90 to 61.90ft AMSL					
.2			49.00 to 60.00ft BGS Material: #1 SILICA SAND					



Page 1 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: VZ-11

DATE COMPLETED: February 28, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC FIELD PERSONNEL: S. DALY

LOCATION: HICKSVILLE, NY

ELEV. SAMPLE DEPTH GAS WELL NEST STRATIGRAPHIC DESCRIPTION & REMARKS ft AMSL 'N' VALUE ft BGS INTERVAL 8 REC (121.35 GROUND SURFACE 121.18 TOPSOIL SAND AND GRAVEL, some silt, loose, fine to VZ-11S TOP OF CASING 120.64 ft medium grained, orange-brown, no odor -2 AMSL VZ-11D TOP OF CASING 120.60 ft AMSL -6 AMSL #1 SILICA SAND 1" 0 SCREEN (1/8" HOLES 1" APART, FILTER CLOTH 8 10 COVER) -12 BENTONITE CHIP SEAL **-- 14** - 16 18 1" Ø SCH 40 PVC RISER 20 22 -24 -26 93.35 -28 SAND AND SILT, trace clay, firm, fine grained, light CEMENT/ BENTONITE GROUT gray and orange 30 -32 1/30/07 CORP.GDT -34 - 36 OVERBURDEN LOG 6883.GPJ CF - loose, tan brown, no odor at 38.0ft BGS MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:



Page 2 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: VZ-11

DATE COMPLETED: February 28, 2006
DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S. DALY

LOCATION: HICKSVILLE, NY

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST			SAM		
1000	· ·	AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
-44 -46 -48 -50 -52 -54			BENTONITE CHIP SEAL SAND PACK 1" 0 SCREEN (1/3" HOLES 1" APART, FILTER CLOTH COVER)					
-58 -60	SAND, loose, medium grained, tan brown and grayish brown	63.35						
-62		58.35	WELL DETAILS Screened interval: 115.35 to 113.35ft AMSL 6.00 to 8.00ft BGS					
-64	END OF BOREHOLE @ 63.0ft BGS STRATIGRAPHY OF VZ-11 FROM IW-18		Length: 2ft Diameter: 1in Stot Size: 125 Material: SCH 40 PVC Seal:					
-68			118.35 to 117.35ft AMSL 3.00 to 4.00ft BGS Material: BENTONITE CHIPS Sand Pack:					
70			117.35 to 112.85ft AMSL 4.00 to 8.50ft BGS Material: #1 SILICA SAND					
72			Screened interval: 70.35 to 65.35ft AMSL 51,00 to 56.00ft BGS					
76			Length: 5ft Diameter: 1In Slot Size: 125 Material: SCH 40 PVC					
78			Seal: 74.35 to 72.35ft AMSL 47.00 to 49.00ft BGS Material: BENTONITE CHIPS					
80			Sand Pack: 72.35 to 61.35ft AMSL 49.00 to 60.00ft BGS Material: #1 SILICA SAND					

	IG WELL INSTRUMENTATION LOG
PROJECT NAME: Hooker Ruco	HOLE DESIGNATION: VZ-1Z
PROJECT No: 6883	- 1.5°1
CLIENT: GS/4I	
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5. Daly
 	CDOUND SUPERIOR
	GROUND SURFACE
	BOREHOLE Ø: 6" in
TOP OF SEAL AT: 3 ft	
BOTTOM OF SEAL AT:ft	SEAL TYPE: <u>benton</u> te chips
	RISER PIPE Ø: /" in MATERIAL: Sich 40 PVC
TOP OF SCREEN AT: ft	1 1 . V / 1
BOTTOM OF SCREEN AT: 8 ft	PACK TYPE: SAND, SIZE #0
BOTTOM OF SCREEN AT: 8 ft 18 ft	SCREEN Ø: /" MATERIAL: 5-4 40 PVC
TOP OF SEAL AT: 8.5 ft	
	SEAL TYPE: bentrike chips
BOTTOM OF SEAL AT: 15' ft	44
	GROUT TYPE: Partland Cement/bentonte
TOP OF SEAL AT: 39.5 #	
	SEAL TYPE: benton the Chips
BOTTOM OF SEAL AT: 41.5 ft	SEAL TYPE: DEATON TO Chips
The state of the s	, "
TOP OF SCREEN AT: 43.51 #	RISER PIPE Ø:ininin
10P OF SCREEN A1: 13.5 π	MATERIAL: FCA 40 PVE
	PACK TYPE: SAND, SIZE #0
	SCREEN Ø:
	MATERIAL: Jr6 40 PVC
BOTTOM OF SCREEN AT: 48.51 ft_	BOTTOM OF HOLE AT: 49'
<u> </u>	ft BOTTOM OF HOLE AT: 77
SCREEN TYPE: AIR: X Continuous Slot	Perforated Louvre Other:
, **	PVC Other:
/ Carlo Divinia (City)	
DEVELOPMENT: METHOD:	DURATION:



Page 1 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

HOLE DESIGNATION: VZ-14
DATE COMPLETED: October 7, 2005

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST	<u> </u>		SAM	1	
ft BGS		AMSL		뀖	₹	8	3	
	GROUND SURFACE	121.32		NUMBER	INTERVAL	REC (%)	'N' VALUE	
	SILTY SAND, trace gravel, light brown, no odor							
-2			VZ-14S TOP OF					
:			RISER 120.97 ft					
-4		116.32	AMSL VZ-14D					
-6	SAND AND GRAVEL, trace silt, fine to medium grained sand, medium to coarse grained gravel, light brown, dry, no odor		TOP OF RISER 121.01 ft AMSL					
-8	 no silt, medium to coarse grained sand, medium to very coarse grained gravel at 7.0ft BGS 		、					
-10			(1/8" HOLES 1", APART,					
-12			FILTER CLOTH COVER)					
14	•		COVER) BENTONITE CHIP SEAL					
- 16								
	- trace silt, orange-brown at 17.0ft BGS							
-18								
-20			1°0 SCH 40 PVC RISER					
-22								
-24		97.32						
[]	SAND, trace silt, trace gravel, medium grained sand, medium to very coarse gravel, light brown, dry, no							
-26	odor - no silt, medium to coarse grained gravel, light		<i> </i>					
-28	brown and orangish brown at 27.0ft BGS	·						
-30								
			CEMENT/					
-32			BENTONITE GROUT					
-34	-							
-36								
	SAND AND SILT, fine grained, reddish brown,	84.32						
-38	moist, no odor - light gray clay lens from 38.0 to 39.0ft BGS							
-40	nging gray day ione from colo to color 500							
-42								
76								
-44								
-46			BENTONITE CHIP SEAL					
	SAND, fine to medium grained, light brown, gray	74.32						
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE; RE	FER TO C	URRENT ELEVATION TABLE					



Page 2 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: VZ-14

DATE COMPLETED: October 7, 2005

DRILLING METHOD: 6" ID ROTASONIC

R BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST			SAM		
IL BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
-50 -52 -54 -56 -58 -60 -62	CLAY, high plasticity, brownish gray and dark brown, moist SW - SAND, fine to medium grained, light brown, orange mottles, moist, no odor	64.32	1"0 SCREEN (1/8" HOLES 1", APART, FILTER CLOTH COVER) #1 SILICA SAND	Z	2			
-66 -68								
70	END OF BOREHOLE @ 69.0ft BGS STRATIGRAPHY OF VZ-14 FROM MW-87	52.32	WELL DETAILS Screened interval: 115.32 to 113.32ft AMSL					
-72 -74 -76	STRATIONALITY OF V2-141 NOIM INVO		6.00 to 8.00ft BGS Length: 2ft Diameter: 1in Slot Size: 125 Material: SCH 40 PVC Seal:					
-78			118.32 to 117.32ft AMSL 3.00 to 4.00ft BGS Material: BENTONITE CHIPS					
-80			Sand Pack: 117.32 to 112.82ft AMSL 4.00 to 8.50ft BGS Material: #1 SILICA SAND					
-82 -84			Screened Interval: 72.32 to 87.32ft AMSL					
- 86 - 88 - 90			49.00 to 54.00ft BGS Length: 5ft Diameter: 1in				- The second sec	
-88			Slot Size: 125 Material: SCH 40 PVC Seal:		į			
-90			76.32 to 74.32ft AMSL 45.00 to 47.00ft BGS Material: BENTONITE CHIPS Sand Pack:					
-92 -94 <u>N</u>			74.32 to 52.32ft AMSL 47.00 to 69.00ft BGS Material: #1 SILICA SAND	}				



Page 1 of 2

PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: VZ-15

PROJECT NUMBER: 6883

DATE COMPLETED: November 4, 2005
DRILLING METHOD: 6" ID ROTASONIC

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

FIELD PERSONNEL: S.DALY

LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST	<u></u>		SAMI		
ft BGS	GROUND SURFACE	AMSL 121.46		NUMBER	NTERVAL	REC (%)	N' VALUE	
	GROUND SURFACE	121.40		Ž	F	R.F.	ż	
	topsoil	120.46						
-2	SAND AND GRAVEL, some slit, light brown, medium coarse grained sand and gravel, no odour		VZ-15S TOP OF RISER 121.31 ft AMSL VZ-15D					
-4			AMSL VZ-15D TOP OF RISER					
-6			121.32 ft AMSL #1 SILICA SAND					
-8 -10		•	SAND 1°0 SCREEN (1/8° HOLES 1° APART, FILTER					
-12			CLOTH COVER)					
-14	,	400 40	BENTONITE CHIP SEAL					
16	SAND, medium grained, light brown, no odor	106.46						
-18	·							
-20			1"0 SCH 40 PVC RISER					
-22 -24								
-26		:						
-28								
-30	- fine-medium grained sand, tan brown, no odor at 29.0ft BGS		CEMENT/ BENTONITE GROUT					
-32			GROUT					
-34								
-36 -38 -40		:						
-40								
-42					- -			
-44		j						



Page 2 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

HOLE DESIGNATION: VZ-15

DATE COMPLETED: November 4, 2005

DRILLING METHOD: 6" ID ROTASONIC

FIELD PERSONNEL: S.DALY LOCATION: HICKSVILLE, NY

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST			SAM		
ft BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
46	- clay lens from 45.0 to 46.0ft BGS							
-48		72.46	BENTONITE CHIP SEAL					
50	SAND AND SILT, fine to medium grained sand, tan brown and light gray, orange mottles	72.40				<u> </u> 		
-52			SAND PACK					
54			1"6 SCREEN (1/8" HOLES 1", APART, FILTER CLOTH					
-56			日 CLOTH COVER)					
-58	SAND, medium grained, light brown, no odor	63.46						
-60		60.46						
-62	CLAY, trace silt, stiff, dark gray	58.46						
-64	END OF BOREHOLE @ 63.0ft BGS STRATIGRAPHY OF VZ-15 FROM MW-81		WELL DETAILS Screened interval: 115.48 to 113.46ft AMSL					
-66			6.00 to 8.00ft BGS Length: 2ft					
-68			Diameter: 1in Slot Size: 125 Material: SCH 40 PVC					
70			Seal: 118.46 to 117.46ft AMSL 3.00 to 4.00ft BGS	:				
-72			Material: BENTONITE CHIPS Sand Pack: 117.46 to 108.96ft AMSL.					
-74			4.00 to 12.50ft BGS Material: #1 SILICA SAND					
-76			Screened interval: 70.46 to 65.46ft AMSL					
-78			51.00 to 56.00ft BGS Length: 5ft Diameter: 1in					
-80			Slot Size: 125 Material: SCH 40 PVC Seal:		:			
-82			74.46 to 72.46ft AMSL 47.00 to 49.00ft BGS					
-84			Material: BENTONITE CHIPS Sand Pack: 72.46 to 58.46ft AMSL					
-86	•		49.00 to 63.00ft BGS Material: #1 SILICA SAND					
-88								
	TES: MEASURING POINT ELEVATIONS MAY CHANGE; I	REFER TO C	CURRENT ELEVATION TABLE					



Page 1 of 2

PROJECT NAME: HOOKER/RUCO SITE

HOLE DESIGNATION: VZ-16

PROJECT NUMBER: 6883

DATE COMPLETED: January 23, 2006

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

DRILLING METHOD: 6" ID ROTASONIC

LOCATION: HICKSVILLE, NY

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	GAS WELL NEST	~		SAM	1	
	GROUND SURFACE	120.42		NUMBER	INTERVAL	REC (%)	N' VALUE	
	SAND AND GRAVEL, trace silt, loose,				_	\vdash		
	medium-coarse, orange brown	i	VZ-16S TOP OF RISER 120.13 ft AMSL					
1			TOP OF RISER 120.13 ft AMSL VZ-160					ł ł
			120.13 ft AMSL					
1			VZ-16D TOP OF					
			RISER 120.27 ft					
			P⊞H AMSL	•				
			#1 SILICA SAND					
	·		1" 0 SCREEN (1/8" HOLES					
0			1" APART, FILTER					
			CLOTH COVER)					
2								
			BENTONITE CHIP SEAL					
4			Onir Seat					
6 -	SAND AND GRAVEL, silty, loose, medium-coarse,	104.42						
	tan brown							
8								
0								
2	·							
.								
4								
6		94,42						
١ ا	SAND, loose, fine-medium sand, tan brown							
8								
o	·		1" 0 SCH 40 PVC RISER				ı	
			PVURISER					
2			<i>22</i>					
	- red brown at 33.0ft BGS			ļ				
\$				l				
3 -	SAND AND SILT, loose, fine-medium sand, tan	84.42						
	brown			ŀ			ĺ	
5		Ī			ľ			
2 4 5			← CEMENT/BEN	CONITE				
'	•		GROUT		1			
NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE; RE	FER TO C	URRENT ELEVATION TABLE					



Page 2 of 2

PROJECT NAME: HOOKER/RUCO SITE

PROJECT NUMBER: 6883

CLIENT: MILLER SPRINGS REMEDIATION MANAGEMENT INC.

LOCATION: HICKSVILLE, NY

HOLE DESIGNATION: VZ-16

DATE COMPLETED: January 23, 2006

DRILLING METHOD: 6" ID ROTASONIC

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	GAS WELL NEST			SAMI		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
-44	SAND, loose, fine-medium sand, tan brown	74.42						
-48 -50	- light grey clay, stiff at 50.0ft BGS		BENTONITE CHIP SEAL					
-52 -54	- light grey medium sand, loose at 52.0ft BGS		SAND PACK 1* Ø SCREEN (1/8* HOLES 1* APART, FILTER					
-56 -58	SAND, loose, medium sand, light grey	64.42	CLOTH COVER)					
-60	END OF BOREHOLE @ 60.0ft BGS		WELL DETAILS					
-62 -64	STRATIGRAPHY OF VZ-16 FROM MW-88		Screened interval: 114.42 to 112.42ft AMSL 6.00 to 8.00ft BGS Length: 2ft Diameter: 1in					
-66		55.42	Stot Size: 125 Material: SCH 40 PVC Seal:					
-68			117.42 to 116.42ft AMS L 3.00 to 4.00ft BGS Material: BENTONITE CHIPS					
-70			Sand Pack: 116.42 to 111.92ft AMSL 4.00 to 8.50ft BGS					
-72			Material: #1 SILICA SAND					
-74			69.42 to 64.42ft AMSL 51.00 to 56.00ft BGS Length: 5ft Diameter: 1in					
-76			Slot Size: 125 Material: SCH 40 PVC Seal:					
-78			73.42 to 71.42ft AMSL 47.00 to 49.00ft BGS Material: BENTONITE CHIPS					
80			Material: #1 SILICA SAND					

VADOSE ZONE MONITORING	WELL INSTRUMENTATION LOG
PROJECT NAME: Hooker Ruco	HOLE DESIGNATION: VZ-17
PROJECT No: 6883	DATE COMPLETED: 12/20/10
CLIENT: GSHT	DRILLING METHOD: Son
LOCATION: Hicksville, NY	CRA SUPERVISOR: 5. Daly
Sat 1	18
	GROUND SURFACE
	4
TOP OF SEAL AT: 3 ft 2	BOREHOLE Ø: 6 In
BOTTOM OF SEAL AT:ft	SEAL TYPE: bentonite chips
	RISER PIPE Ø:in
TOP OF SCREEN AT: 6 ft 1	RISER PIPE Ø: in MATERIAL: Sch 40 FVC
BOTTOM OF SCREEN AT 8 #	PACK TYPE: SAND, SIZE #0 Jand
BOTTOM OF SCREEN AT: 8 ft_	SCREEN Ø: MATERIAL: Sch 40 PVC
TOP OF SEAL AT: 8.5 ft	WATERIAL: SCHOOL
101 01 02/12/11 #	SEAL TYPE: benton to Chips
BOTTOM OF SEAL AT: /5 n	ODAL TIPE. OCHIANTAL (MIPS
	GROUT TYPE: Portland coment/bentonite
	Service Transport
TOP OF SEAL AT: 27 ft	
BOTTOM OF SEAL AT: 3/ ft	SEAL TYPE: bentanita chips
BOTTOW OF SEAL AT. DE IL MANAGEMENT SEAL AT.	(京京教育)
22	RISER PIPE Ø: in
TOP OF SCREEN AT: 33 ft 1	MATERIAL: Sch 40 PVC
,	PACK TYPE: SAND, SIZE #0
8	SCREEN Ø:
	MATERIAL: Sch 40 Pyc
BOTTOM OF SCREEN AT: 38 ft	
clay layer from 39' to 49' hole fil	BOTTOM OF HOLE AT: 50' ft
they help from 34 to 19 Note Til	led with bentonite chips to 39'
SCREEN TYPE: AIR: X Continuous Slot Per	familia [] Laura [] Oli
	forated Louvre Other:
, W "	PVC Other:
HOLE DIAMETER:	
DEVELOPMENT: METHOD:	DURATION:

APPENDIX C

CERTIFICATES

STATE OF NEW YORK PUBLIC SERVICE COMMISSION

At a session of the Public Service Commission held in the City of Albany on November 8, 2006

COMMISSIONERS PRESENT:

William M. Flynn, Chairman Patricia L. Acampora Maureen F. Harris Robert E. Curry, Jr. Cheryl A. Buley

CASE 06-W-0964 - Joint Petition of Northrop Grumman Corporation and Northrop Grumman Systems Corporation for a Declaratory Ruling That Public Service Commission Approval is Not Required for Providing Limited Water Service to Occidental Petroleum Corporation in Connection with its Groundwater Remediation Plan.

ORDER GRANTING EXEMPTIONS FROM WATER REGULATION

(Issued and Effective November 13, 2006)

BY THE COMMISSION:

SUMMARY

Northrop Grumman Corporation (NGC) and Northrop Grumman Systems Corporation (NGSC) (collectively, the joint petitioners) seek a declaratory ruling that the provision of limited water service to Occidental Petroleum Corporation (Occidental) does not need formal approval. If such request is denied, the joint petitioners request approval for the provision of such limited water service. We deny the request for a declaratory ruling and approve the joint petitioners' request to provide limited water service, with attendant lightened regulation, to Occidental.

BACKGROUND

In a Joint Petition filed on August 8, 2006, NGC and NGSC request a declaratory ruling that the provision of limited water service to Occidental) in connection with Occidental's groundwater remediation plan for the Hooker Chemical/Ruco Polymer Superfund Site (Hooker Chemical Site) vinyl chloride plume does not require formal approval. The joint petitioners seek, in the alternative, approval for the provision of such water service to Occidental.

In 2004, NGC and NGSC made a similar request for the provision of limited water service to Calpine Eastern Corporation (Calpine). In the October 2004 Order, we determined that the proposed water provision to Calpine qualified NGC and NGSC for exemptions from accounting, reporting and filing requirements under Public Service Law (PSL) \$89-c(11). NGC and NGSC remain subject to the Public Service Law with respect to such matters as safety, customer complaints, enforcement, investigation and reliability. We also required NGC and NGSC to obtain approval prior to the provision of water services to users other than those approved under the October 2004 Order.

The Joint Petition

NGC and NGSC state that NGC is a major defense contractor, with annual revenues in 2005 of more than \$30 billion, specializing in the manufacturing of aerospace and electronic equipment and products. NGSC is a wholly-owned subsidiary of NGC that operates and maintains the systems necessary to support the manufacturing and other operations of NGC on its sites in the United States.

Case 04-W-0886, Joint Petition of Northrop Grumman Corporation and Northrop Grumman Systems Corporation, Order Granting Exemptions from Water Regulation (issued October 27, 2004) (October 2004 Order).

Occidental is responsible for the remediation of the Hooker Chemical Site located in Hicksville, New York, including the associated groundwater plume which runs beneath a Bethpage site where NGC has wells that serve. In order to implement its remediation plan, Occidental purchased a small parcel of the Bethpage site from NGC and installed a control building. Its remediation plan's primary objective is to deliver oxygen into the impacted zone of the aquifer. Once this oxygen is introduced and comes into contact with the vinyl chloride, the microorganisms residing in the groundwater will be stimulated and will biodegrade the vinyl chloride plume which emanates from the Site.

extracted from NGC's wells on the Bethpage site as part of its remediation program administered by the New York State

Department of Environmental Conservation(DEC) would normally be discharged to surface recharge basins located on that site.

This water is processed through an air stripper and is saturated with oxygen. The joint petitioners propose to provide this oxygenated water to Occidental to assist Occidental in fulfilling the requirements of its remediation plan. The joint petitioners assert that NGC is required to return as much of the extracted groundwater as possible back into the formation from which it originated. Thus, the provision of this water to Occidental in relation to the remediation plan would simply be a different means of returning NGC's water to the formation in which it originated.

According to the joint petitioners, discussions between Occidental, NGC, the United States Environmental Protection Agency (EPA) and the DEC have resulted in all parties supporting NGC's plan to provide limited water service to Occidental to help implement Occidental's remediation plan. The use of NGC's oxygenated water for the specific purpose proposed

CASE 06-W-0964

by the joint petitioners was agreed to by both the EPA and the DEC.

The EPA-approved remediation plan relies on an injection rate of oxygenated water into the plume at the rate of approximately four gallons per minute (gpm). This equals approximately 7,000 gallons per day and comprises approximately five minutes of the total volume of water extracted by NGC's from two of the wells in any given 24-hour day. The joint petitioners have agreed to make additional water (up to 15 gpm with a maximum provision of 20 gpm) available to Occidental as needed.

The joint petitioners note that Wells 1 and 3, the source of the oxygenated water proposed to be delivered to Occidental, are the same sources that the joint petitioners use to supply Calpine. The proposed delivery of oxygenated water to Occidental will not affect the joint petitioners' ability to meet their water supply obligations to Calpine.

NGC and NGSC assert that they will not install any new systems or water delivery facilities in connection with the proposed provision of water to Occidental. A meter will be installed at Occidental's control building on the Bethpage site to ensure that that the quantity of water delivered is consistent with Occidental's remediation plan. The joint petitioners state that they will not charge Occidental for the provision of oxygenated water and that they have no intention of expanding the provision of water beyond those services provided to Calpine and Occidental. The joint petitioners reaffirm that their water supply operations remain wholly incidental and subsidiary to their primary business.

PUBLIC NOTICE

Notice of the petition was published in the $\underline{\text{State}}$ Register on September 6, 2006, in conformance with State

Administrative Procedure Act §202(1). The comment period expired on October 23, 2006. No comments have been submitted.

DISCUSSION AND CONCLUSION

The joint petitioners' request for a declaratory ruling that the proposed provision of limited water service to Occidental does not require formal approval is denied. The provision of limited water services, with attendant lightened regulation, requires us to determine if the water utility operations are incidental and subsidiary to the primary business of the entity seeking such lightened regulation. Additionally, since such lightened regulation does not exempt the entity providing the limited water service from complying with other provisions of the Public Service Law, it is necessary for us to be apprised of the provision of such limited water service. Thus, the joint petitioners must obtain formal approval for the provision of water service.

Although the joint petitioners' request for a declaratory ruling is denied, we approve the request for the provision of limited water service and find that such provision to Occidental qualifies for exemptions from accounting, reporting and filing requirements under PSL §89-c(11). However, the joint petitioners shall remain subject to the Public Service Law in relation to matters such as safety, customer complaints, enforcement, investigation, and reliability.

Under §89-c(11), a business that operates water plant may be exempted from record-keeping and filing requirements if its water utility operations are subsidiary and incidental to its primary business. The joint petitioners' furnishing of water to Occidental is incidental and subsidiary to their primary businesses. Therefore, pursuant to §89-c(11), NGC and NGSC shall be exempted from keeping accounts, records, and books; from the filing of annual reports; and, from the filing

of rate schedules and tariffs, on water service provided to Occidental. This exemption from regulation is similar to exemptions granted other entities, providing service incidental to a primary business.²

Additionally, it is appropriate to continue to apply the Indeck-Olean approach when analyzing proceedings such as this. In that case, Indeck-Olean Limited Partnership (IOLP) filed a petition requesting that it be lightly regulated in regard to its steam production and service pursuant to PSL \$80(11). In analyzing that request, we also addressed the need for consumer protections between IOLP and the Dresser-Rand Company, the recipient of IOLP's steam service. As we explained:

[The parties] have negotiated, at arm's length, a binding contract governing steam sales. Interference with that contract, which establishes the relationship between two sophisticated business entities, would serve no regulatory purpose. Therefore, it is not necessary under these circumstances to impose conditions to protect consumer interests.⁴

The conclusion reached in the Indeck-Olean Case is applicable to the NGC and NGSC petition. NGC, NGSC and Occidental may be considered sophisticated business entities

Case 02-W-0742, Independent Water Works, Inc. - Initial Tariff Filing, Untitled Order (issued November 22, 2002); Case 02-W-1154, Rochester Technology Park Utility Company LLC - Request for a Declaratory Ruling, Order Granting Exemptions from Water Regulation (issued December 23, 2002); Case 04-W-0886, supra.

Case 00-M-2231, Indeck-Olean Limited Partnership - Request for a Declaratory Ruling and for a Certificate of Public Convenience and Necessity, Order Providing for Lightened Regulation and Granting a Certificate of Public Convenience and Necessity to Produce and Deliver Steam (issued May 2, 2001).

⁴ Case 00-M-2231, <u>supra</u>, pp. 11-12.

CASE 06-W-0964

capable of negotiating a binding contract for the limited provision of water service. Based on their level of sophistication, there is no need to impose consumer protections on this limited water service.

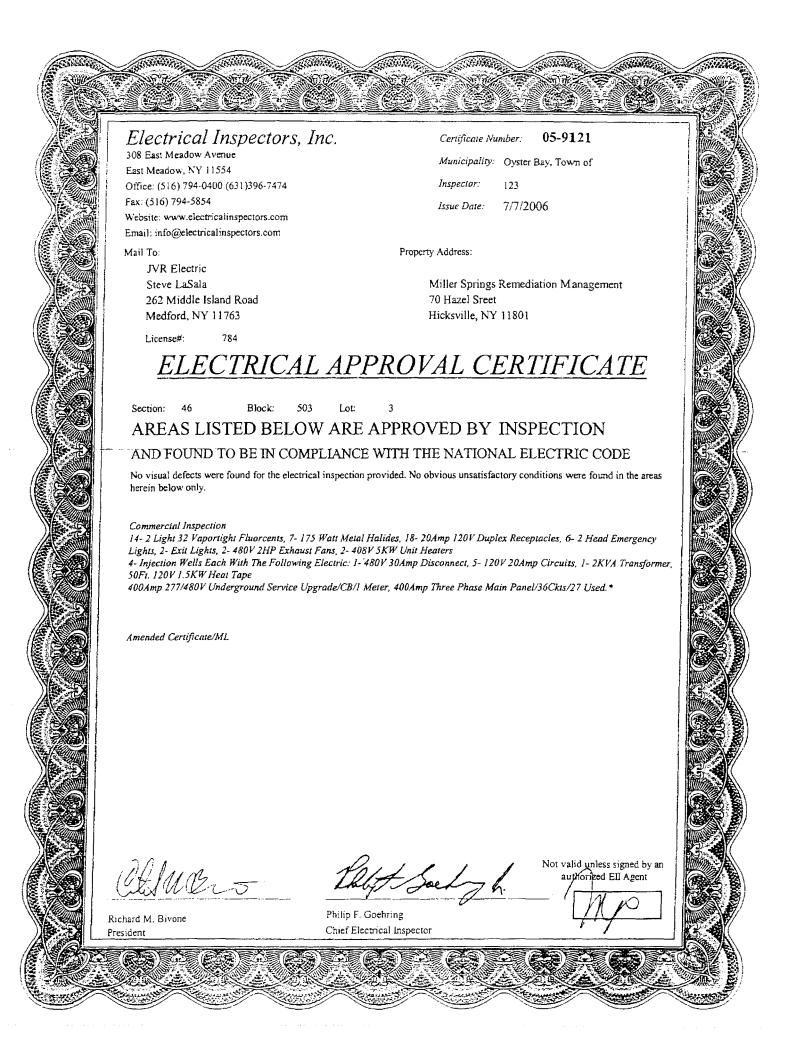
The Commission orders:

- 1. NGC's and NGSC's request for a declaratory ruling is denied.
- 2. NGC and NGSC are authorized to provide limited water service to Occidental Petroleum Corp., as discussed in the body of this Order.
- 3. NGC and NGSC are exempted from complying with the accounting, reporting, and filing requirements of PSL §89-c(11) in relation to their provision of water service to Occidental Petroleum Corporation. NGC and NGSC shall otherwise comply with the requirements of the Public Service Law as discussed in the body of this Order.
- 4. Northrop Grumman Corporation and Northrop Grumman Systems Corporation must obtain Commission approval for provision of water service to entities other than Calpine Eastern Corporation or Occidental Petroleum Corporation.
 - 5. This proceeding is closed.

By the Commission,

(SIGNED)

JACLYN A. BRILLING Secretary





Certificate of Approval of Plumbing
Town of Oyster Bay Department of Planning and Development
Division of Building 74 Audress Avenue Overter Bay New York 11771

Propert	y Information	7 <u> </u>	D :1		03	Lot(s)	3		Zone LI
Located o		Side of OYSTER BAY	————	eet 100	T HAZ	of ZEL STREET		Post Offic HICKSVI	
L	Contractor Info:	— <u>programma</u>	<u> </u>						
Addres	s of installation:	SW CORNE	R S.OYSTE	R BAY & HA	ZEL ST HI	CKSVILLE, N	NY 11801		
	44 A FERSON BOOK LADOUR STORY								
Appl. No.	Permit No.	Permit Date	Gas/Oll/Plb.	Gas/Oil Date	Sewer No.	Sewer Date	Receipt No.	Insp	Date
Appl. No. 2535	Permit No. R35495		Gas/Oll/Plb.	Gas/Oil Date	Sewer No.	Sewer Date / /	Receipt No. H283014	insp MB	
		Permit Date	Gas/Oll/Plb.	Gas/Oil Date / /	Sewer No.	Sewer Date //	•	•	
	R35495	Permit Date	Gas/Oll/Pib.	Gas/Oil Date / /	Sewer No.	Sewer Date / /	•	•	Date 07/28/2006
2535 /ork Con	R35495 npleted	Permit Date		11			•	•	
2535 /ork Con	R35495 npleted	Permit Date 11/10/2005		11			•	•	
2535 Vork Con	R35495 npleted	Permit Date 11/10/2005		11			•	•	
2535 Vork Con	R35495 npleted	Permit Date 11/10/2005		11			•	•	



Certificate of Occupancy
Town of Oyster Bay Department of Planning and Development Division of Building, 74 Audrey Avenue, Oyster Bay, New York 11771

, <u>17 - 1</u>											
MILLER S	PRINGS R	MEDIATIO	N MGT	INC,	2480 FOF	ITUNE	DA. #3	00 LEXINGTON	I, KY 405	i 0 8	
										1 1	
			21		46	503		3	- · - · ·		u B
		3.14		3			7				
SW	SOUTH	OYSTER B	AY	0.000	000		HA	ZEL STREET		HICKSVIL	LE
المحصوا	. 11	المنظل المنظل	أنجرا		بتنظيع	أريي	بنالاواد				
		SW CORN	IER S.O	YSTE	R BAY & I	HAZEL	ST HI	CKSVILLE, NY 1	1801		
Appl. No.	Permit No.	Permit Date	Rece	pt No.	Z.B.A.	No.	Date	Town Soard No.	Date	CA No.	Elec No.
2535	R35495	11/10/2006	H28	3014			11	. :	11	G47321	06- 9 121

Work Completed

R35495-A 28' x 38' one (1) story (Type 2b)(Non-Fire Sprinklered)(F-2) pre-engineered metal (Structural Steel Rigid Framed) building to accommodate use for 'BIOSPARGE TREATMENT SYSTEM" (F-2) tenancy.

This certifies that the above construction conforms with the approved plans and codes of the Town of Oyster Bay and the Have York State Fire Prevention and Building Code.

TOBDPD Certificate of Occupancy - Owner's Copy

Commissioner, Department of Planning and Development



AUG 1 1 2006 RAYMOND A. RIBEIRO, P.E. COMMISSIONER

COUNTY OF NASSAU DEPARTMENT OF PUBLIC WORKS

1194 Prospect Avenue Westbury, New York 11590-2723

August 7, 2006

Mr. Stephen A. Whyte Miller Springs Remediation Management, Inc. 2480 Fortune Drive Lexington, KY 40509

Re: Acceptance of Air Compressor Condensate Water from Biosparge System Control Building, Hicksville, NY to the Nassau County Sanitary Sewer.

Dear Mr. Whyte:

Your request, as stated in your letter of August 1, 2006, to discharge air compressor condensate water to the Nassau County sanitary sewer from the above referenced location has been reviewed and is approved.

This approval is based on the innocuous nature of the waste as confirmed by our analysis and the minor volumes proposed for discharge (less than 430 gallons per week).

Thank you for your concern and cooperation. If you have any questions concerning this matter, please feel free to contact me at (516)571-7352.

Very truly yours,

Vincent J. Monge

Sewage Treatment Chemist III

C: Richard Cotugno